2001-2003

HONDA

SERVICE MANUAL

CBR600F4i

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the CBR600F41.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition and the emission levels are within the standards set by the U.S. Environmental Protection Agency, California Air Resources Board and Transport Canada.

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Sections 1 and 3 apply to the whole motorcycle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections. Sections 4 through 19 describe parts of the motorcycle, grouped according to location.

Find the section you want on this page, then turn to the table of contents on the first page of the section.

Most sections start with an assembly or system illustration, service information and troubleshooting for the section. The subsequent pages give detailed procedures.

If you are not familiar with this motorcycle, read Technical Feature in Section 21.
If you do not know the source of the trouble, go to section 22 Troubleshooting.

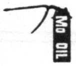
> Your safety, and the safety of others, is very important. To help you make informed decisions we have provided safety messages and other information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing this vehicle.
> You must use your own good judgement.
> You will find important safety information in a variety of forms including:
> - Safety Labels – on the vehicle
> - Safety Messages – preceded by a safety alert symbol ⚠ and one of three signal words, DANGER, WARNING, or CAUTION.
>
> These signal words mean:
>
> **⚠ DANGER** You WILL be KILLED or SERIOUSLY HURT if you don't follow instructions.
>
> **⚠ WARNING** You CAN be KILLED or SERIOUSLY HURT if you don't follow instructions.
>
> **⚠ CAUTION** You CAN be HURT if you don't follow instructions.
>
> - Instructions – how to service this vehicle correctly and safely.

As you read this manual, you will find information that is preceded by a NOTICE symbol. The purpose of this message is to help prevent damage to your vehicle, other property, or the environment.

CONTENTS

SYMBOLS

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it would be explained specifically in the text without the use of the symbols.

	Replace the part(s) with new one(s) before assembly.
	Use recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1)
	Use multi-purpose grease (lithium based multi-purpose grease NLGI #2 or equivalent).
	Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® BR-2 plus manufactured by Dow Corning U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent). Example: Molykote® G-n Paste manufactured by Dow Corning U.S.A. Honda Moly 60 (U.S.A. only) Rocol ASP manufactured by Rocol Limited, U.K. Rocol Paste manufactured by Sumico Lubricant, Japan
	Use silicone grease.
	Apply a locking agent. Use a medium strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use fork or suspension fluid.

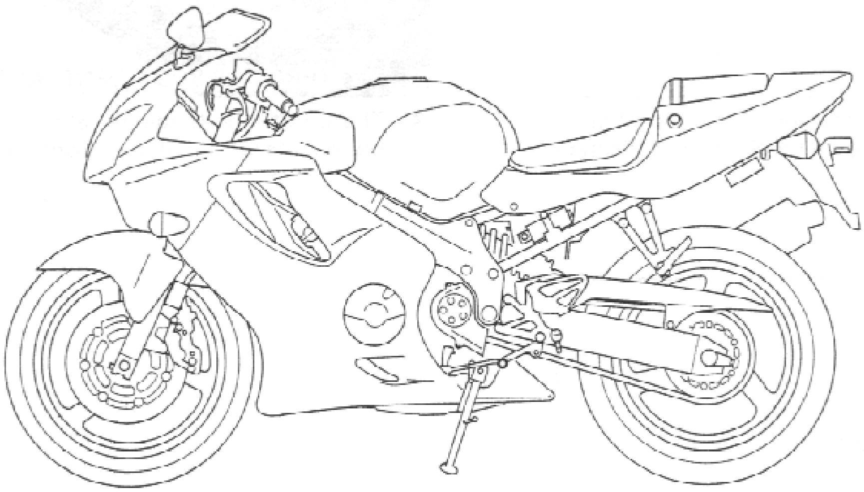
1. GENERAL INFORMATION

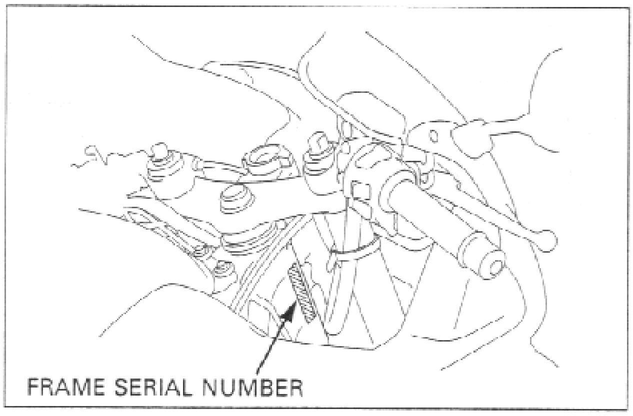
1

SERVICE RULES

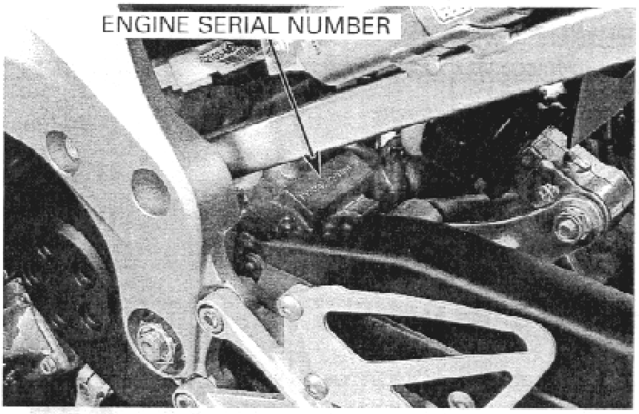
1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that do not meet HONDA's design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown on pages 1-23 through 1-37, Cable and Harness Routing.

MODEL IDENTIFICATION

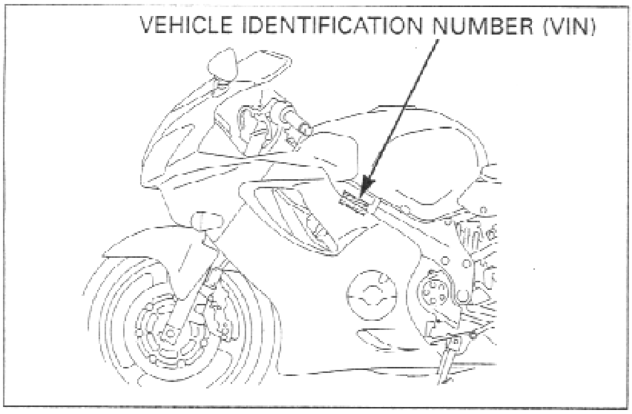




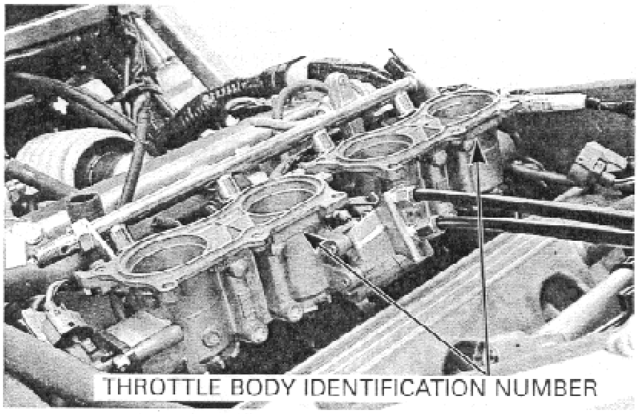
(1) The frame serial number is stamped on the right side of the steering head.



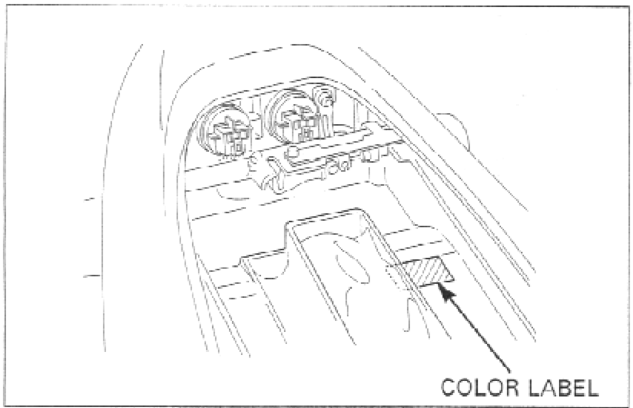
(2) The engine serial number is stamped on the right side of the upper crankcase.



(3) The Vehicle Identification Number (VIN) is located on left side of the main frame on the Safety Certification Labels.



(4) The throttle body identification number is stamped on the intake side of the throttle body as shown.



(5) The color label is attached as shown. When ordering color-coded parts, always specify the designated color code.

SPECIFICATIONS

GENERAL

	ITEM	SPECIFICATIONS
DIMENSIONS	Overall length	2,041 mm (80.4 in)
	Overall width	685 mm (27.0 in)
	Overall height	1,135 mm (44.7 in)
	Wheelbase	1,386 mm (54.6 in)
	Seat height	810 mm (31.9 in)
	Footpeg height	360 mm (14.2 in)
	Ground clearance	135 mm (5.3 in)
	Dry weight	
	49 States/Canada type	168 kg (370 lbs)
	California type	169 kg (373 lbs)
	Curb weight	
	49 States/Canada type	196 kg (432 lbs)
	California type	197 kg (434 lbs)
	Maximum weight capacity	175 kg (386 lbs)
FRAME	Frame type	Diamond
	Front suspension	Telescopic fork
	Front axle travel	120 mm (4.7 in)
	Rear suspension	Swingarm
	Rear axle travel	120 mm (4.7 in)
	Front tire size	120/70 ZR 17 (58W)
	Rear tire size	180/55 ZR 17 (73W)
	Front tire brand	BT010FF (Bridgestone) D207FJ (Dunlop) Pilot SPORT E (Michelin)
	Rear tire brand	BT010RF (Bridgestone) D207P (Dunlop) Pilot SPORT E (Michelin)
	Front brake	Hydraulic double disc
	Rear brake	Hydraulic single disc
	Caster angle	24°
	Trail length	96 mm (3.8 in)
	Fuel tank capacity	18.0 liter (4.76 US gal, 3.96 Imp gal)
ENGINE	Cylinder arrangement	4 cylinders in-line, inclined 31° from vertical
	Bore and stroke	67.0 x 42.5 mm (2.64 x 1.67 in)
	Displacement	599 cm^3 (36.5 cu-in)
	Compression ratio	12.0 : 1
	Valve train	Chain driven, DOHC
	Intake valve opens (at 1 mm (0.04 in) lift)	22° BTDC
	Intake valve closes (at 1 mm (0.04 in) lift)	43° ABDC
	Exhaust valve opens (at 1 mm (0.04 in) lift)	38° BBDC
	Exhaust valve closes (at 1 mm (0.04 in) lift)	7° ATDC
	Lubrication system	Forced pressure and wet sump
	Oil pump type	Trochoid
	Cooling system	Liquid cooled
	Air filtration	Paper element
	Engine dry weight	59 kg (130 lbs)
	Firing order	1 - 2 - 4 - 3

GENERAL (Cont'd)

ITEM			SPECIFICATIONS
CARBURETION	Type		PGM-FI (Programmed Fuel Injection)
	Throttle bore		38 mm (1.5 in)
DRIVE TRAIN	Clutch system		Multi-plate, wet
	Clutch operation system		Cable operating
	Transmission		Constant mesh, 6-speeds
	Primary reduction		1.822 (82/45)
	Final reduction		2.875 (46/16)
	Gear ratio	1st	2.833 (34/12)
		2nd	2.062 (33/16)
		3rd	1.647 (28/17)
		4th	1.421 (27/19)
		5th	1.272 (28/22)
		6th	1.173 (27/23)
	Gearshift pattern		Left foot operated return system, 1 – N – 2 – 3 – 4 – 5 – 6
ELECTRICAL	Ignition system		Computer-controlled digital transistorized with electric advance
	Starting system		Electric starter motor
	Charging system		Triple phase output alternator
	Regulator/rectifier		SCR shorted/triple phase, full wave rectification
	Lighting system		Battery

Unit: mm (in)

LUBRICATION SYSTEM

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	3.0 liter (3.2 US qt, 2.6 Imp qt)	—
	After draining/filter change	3.3 liter (3.5 US qt, 2.9 Imp qt)	—
	After disassembly	3.7 liter (3.9 US qt, 3.3 Imp qt)	—
Recommended engine oil		Pro HONDA GN4 or HP4 4-stroke oil (U.S.A. and Canada) or Honda 4-stroke oil (Canada only), or equivalent motor oil API service classification SF or SG Viscosity: SAE 10W–40	—
Oil pressure at oil pressure switch		490 kPa (5.0 kgf/cm², 71 psi) at 6,000 rpm (80°C/176°F)	—
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.22 (0.006 – 0.009)	0.35 (0.014)
	Side clearance	0.02 – 0.07 (0.001 – 0.003)	0.10 (0.004)

FUEL SYSTEM (Programmed Fuel Injection)

ITEM		SPECIFICATIONS
Throttle body identification number	except California type	GQ90C
	California type	GQ90B
Starter valve vacuum difference		20 mm Hg
Base throttle valve for synchronization		No.1
Idle speed		1,300 ± 100 rpm
Throttle grip free play		2 – 6 mm (1/16 – 1/4 in)
Intake air temperature sensor resistance (at 20°C/68°F)		1 – 4 kΩ
Engine coolant temperature sensor resistance (at 20°C/68°F)		2.3 – 2.6 kΩ
Fuel injector resistance (at 20°C/68°F)		11.1 – 12.3 Ω
PAIR solenoid valve resistance (at 20°C/68°F)		20 – 24 Ω
Cam pulse generator peak voltage (at 20°C/68°F)		0.7 V minimum
Ignition pulse generator peak voltage (at 20°C/68°F)		0.7 V minimum
Manifold absolute pressure at idle		150 – 250 mm Hg
Fuel pressure at idle		343 kPa (3.5 kgf/cm², 50 psi)
Fuel pump flow (at 12-V)		Minimum 188 cm³ (6.4 US oz, 6.6 Imp oz) for 10 seconds

COOLING SYSTEM

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.7 liter (2.9 US qt, 2.4 Imp qt)
	Reserve tank	0.31 liter (0.33 US qt, 0.27 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)
Thermostat	Begin to open	80 – 84 °C (176 – 183 °F)
	Fully open	90 °C (194 °F)
	Valve lift	8 mm (0.3 in) minimum
Recommended antifreeze		Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing corrosion protection inhibitors
Standard coolant concentration		50% mixture with soft water

CYLINDER HEAD/VALVES

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,226 kPa (12.5 kgf/cm², 178 psi) at 350 rpm	—
Valve clearance		IN	0.20 ± 0.03 (0.008 ± 0.001)	—
		EX	0.28 ± 0.03 (0.011 ± 0.001)	—
Camshaft	Cam lobe height	IN	36.56 – 36.80 (1.439 – 1.449)	36.5 (1.44)
		EX	35.34 – 35.58 (1.391 – 1.401)	35.3 (1.39)
	Runout		—	0.05 (0.002)
	Oil clearance		0.030 – 0.072 (0.0012 – 0.0028)	0.10 (0.004)
Valve lifter	Valve lifter O.D.		25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
	Valve lifter bore I.D.		26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)
Valve, valve guide	Valve stem O.D.	IN	3.975 – 3.990 (0.1565 – 0.1571)	3.965 (0.1561)
		EX	3.965 – 3.980 (0.1561 – 0.1567)	3.955 (0.1557)
	Valve guide I.D.	IN/EX	4.000 – 4.012 (0.1575 – 0.1580)	4.04 (0.159)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.075 (0.0030)
		EX	0.020 – 0.047 (0.0008 – 0.0019)	0.085 (0.0033)
	Valve guide projection above cylinder head	IN	16.1 – 16.4 (0.63 – 0.65)	—
		EX	14.3 – 14.6 (0.56 – 0.57)	—
	Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length	IN	Outer	42.2 (1.66)	41.36 (1.628)
		Inner	36.4 (1.43)	35.57 (1.400)
	EX		36.3 (1.43)	35.57 (1.400)
Cylinder head warpage			—	0.10 (0.004)

Unit: mm (in)

CLUTCH/GEARSHIFT LINKAGE

ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10 – 20 (3/8 – 13/16)	—
Clutch	Spring free length	44.7 (1.76)	43.4 (1.71)
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.6 (0.10)
	Plate warpage	—	0.30 (0.012)
Clutch outer guide	I.D.	25.000 – 25.021 (0.9843 – 0.9851)	25.03 (0.985)
	O.D.	34.975 – 34.991 (1.3770 – 1.3776)	34.97 (1.377)
Mainshaft O.D. at clutch outer guide		24.980 – 24.993 (0.9835 – 0.9840)	24.96 (0.983)

Unit: mm (in)

ALTERNATOR/STARTER CLUTCH

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	51.699 – 51.718 (2.0354 – 2.0361)	51.684 (2.0348)

Unit: mm (in)

CRANKCASE/TRANSMISSION

ITEM			STANDARD	SERVICE LIMIT
Shift fork, fork shaft	I.D.		12.000 – 12.021 (0.4724 – 0.4733)	12.03 (0.474)
	Claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
	Shift fork shaft O.D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
Transmission	Gear I.D.	M5, M6	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C2, C3, C4	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
	Gear bushing O.D.	M5, M6	27.959 – 27.980 (1.1007 – 1.1016)	27.94 (1.100)
		C2	30.955 – 30.980 (1.2187 – 1.2197)	30.94 (1.218)
		C3, C4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
	Gear-to-bushing clearance	M5, M6	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C2	0.020 – 0.070 (0.0008 – 0.0028)	0.10 (0.004)
		C3, C4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Gear bushing I.D.	M5	24.985 – 25.006 (0.9837 – 0.9845)	25.016 (0.9849)
		C2	27.985 – 28.006 (1.1018 – 1.1026)	28.021 (1.1032)
	Mainshaft O.D.	at M5	24.967 – 24.980 (0.9830 – 0.9835)	24.96 (0.983)
	Countershaft O.D.	at C2	27.967 – 27.980 (1.1011 – 1.1016)	27.96 (1.101)
	Bushing-to-shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)
		C2	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)

CRANKSHAFT/PISTON/CYLINDER

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.10 – 0.25 (0.004 – 0.010)	0.30 (0.012)
	Crankpin bearing oil clearance		0.028 – 0.052 (0.0011 – 0.0020)	0.06 (0.002)
	Main journal bearing oil clearance		0.020 – 0.038 (0.0008 – 0.0015)	0.05 (0.002)
	Runout		—	0.05 (0.002)
Piston, piston rings	Piston O.D. at 15 mm (0.6 in) from bottom		66.965 – 66.985 (2.6364 – 2.6372)	66.90 (2.634)
	Piston pin bore I.D.		17.002 – 17.008 (0.6694 – 0.6696)	17.02 (0.670)
	Piston pin O.D.		16.994 – 17.000 (0.6691 – 0.6693)	16.98 (0.669)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)
	Piston ring end gap	Top	0.10 – 0.20 (0.004 – 0.008)	0.4 (0.02)
		Second	0.18 – 0.30 (0.007 – 0.012)	0.5 (0.02)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	1.0 (0.04)
	Piston ring-to-ring groove clearance	Top	0.020 – 0.050 (0.0008 – 0.0020)	0.08 (0.003)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.08 (0.003)
Cylinder	I.D.		67.000 – 67.015 (2.6378 – 2.6384)	67.10 (2.642)
	Out-of-round		—	0.10 (0.004)
	Taper		—	0.10 (0.004)
	Warpage		—	0.10 (0.004)
Cylinder-to-piston clearance			0.015 – 0.050 (0.0006 – 0.0022)	0.10 (0.004)
Connecting rod small end I.D.			17.016 – 17.034 (0.6699 – 0.6706)	17.04 (0.671)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)

Unit: mm (in)

FRONT WHEEL/SUSPENSION/STEERING

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	Up to 90 kg (200 lb) load	250 kPa (2.50 kgf/cm², 36 psi)	—
	Up to maximum weight capacity	250 kPa (2.50 kgf/cm², 36 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	60 g (2.1 oz) max.
Fork	Spring free length	286 (11.3)	280.3 (11.03)
	Tube runout	—	0.20 (0.008)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8	—
	Fluid level	116 (4.6)	—
	Fluid capacity	462 ± 2.5 cm³ (15.6 ± 0.08 US oz, 16.3 ± 0.09 Imp oz)	—
	Pre-load adjuster initial setting	4th groove from top	—
	Rebound adjuster initial setting	1-3/4 turns out from fully turned in	—
	Compression adjuster initial setting	1-1/4 turns out from fully turned in	—
Steering head bearing pre-load		1.0 – 1.5 kgf (2.2 – 3.3 lbf)	—

Unit: mm (in)

REAR WHEEL/SUSPENSION

ITEM			STANDARD	SERVICE LIMIT
Minimum tire tread depth			—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lb) load		290 kPa (2.90 kgf/cm², 42 psi)	—
	Up to maximum weight capacity		290 kPa (2.90 kgf/cm², 42 psi)	—
Axle runout			—	0.2 (0.01)
Wheel rim runout	Radial		—	2.0 (0.08)
	Axial		—	2.0 (0.08)
Wheel balance weight			—	60 g (2.1 oz) max.
Drive chain	Size/link	DID	DID525HV-108LE	—
		RK	RKGB525ROZ1-108LE	—
	Slack		25 – 35 (1 – 1-3/8)	—
Shock absorber	Spring adjuster standard position		Position 3	—
	Rebound adjuster initial setting		1-1/2 turns out from fully turned in	—
	Compression adjuster initial setting		1-1/2 turns out from fully turned in	—

HYDRAULIC BRAKE

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Front	Specified brake fluid		Honda DOT 4 Brake Fluid	—
	Brake disc thickness		4.4 – 4.6 (0.17 – 0.18)	3.5 (0.14)
	Brake disc runout		—	0.20 (0.008)
	Master cylinder I.D.		15.870 – 15.913 (0.6248 – 0.6265)	15.925 (0.6270)
	Master piston O.D.		15.827 – 15.854 (0.6231 – 0.6242)	15.815 (0.6226)
	Caliper cylinder I.D.	A	33.96 – 34.01 (1.337 – 1.339)	34.02 (1.339)
		B	32.030 – 32.080 (1.2610 – 1.2630)	32.09 (1.263)
	Caliper piston O.D.	A	33.802 – 33.835 (1.3308 – 1.3321)	33.794 (1.3305)
		B	31.877 – 31.910 (1.2550 – 1.2563)	31.869 (1.2547)
Rear	Specified brake fluid		Honda DOT 4 Brake Fluid	—
	Brake pedal height		75 (3.0)	—
	Brake disc thickness		4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)
	Brake disc runout		—	0.30 (0.012)
	Master cylinder I.D.		14.000 – 14.043 (0.5512 –0.5529)	14.055 (0.5533)
	Master piston O.D.		13.957 – 13.984 (0.5495 –0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.		38.18 – 38.23 (1.053 – 1.505)	38.24 (1.506)
	Caliper piston O.D.		38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)

BATTERY/CHARGING SYSTEM

ITEM			SPECIFICATIONS
Battery	Capacity		12-V – 8.6 Ah
	Current leakage		2.0 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2-V
		Needs charging	Below 12.3-V
	Charging current	Normal	0.9 A/5 – 10 h
		Quick	4.5 A/0.5 h
Alternator	Capacity		0.433 kW/5,000 rpm
	Charging coil resistance (20°C/68°F)		0.1 – 1.0 Ω

IGNITION SYSTEM

ITEM		SPECIFICATIONS
Spark plug (iridium)	NGK	IMR9A-9H
	DENSO	IUH27D
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		13° BTDC at idle

ELECTRIC STARTER

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0 – 13.0 (0.47 – 0.51)	6.5 (0.26)

LIGHTS/METERS/SWITCHES

ITEM			SPECIFICATIONS
Bulbs	Headlight	Hi	12V – 55 W
		Lo	12V – 55 W
	Brake/tail light		12V – 21/5 W x 2
	Front turn signal/running light		12V – 32/3 CP (23/8 W) x 2
	Rear turn signal light		12V – 32 CP (23 W) x 2
	License light		12V – 4 CP (5 W)
	Instrument light		LED
	Turn signal indicator		LED
	High beam indicator		LED
	Neutral indicator		LED
	Oil pressure indicator		LED
	PGM-FI warning indicator		LED
	Low fuel indicator		LED
Fuse	Main fuse		30 A
	PGM-FI fuse		20 A
	Sub fuse		10 A x 6
Tachometer peak voltage			10.5 V minimum
Fan motor switch	Start to close (ON)		98 – 102 °C (208 – 216 °F)
	Stop to open		93 – 97 °C (199 – 207 °F)

TORQUE VALUES

FASTENER TYPE	TORQUE N•m (kgf•m, lbf•ft)	FASTENER TYPE	TORQUE N•m (kgf•m, lbf•ft)
5 mm hex bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
6 mm hex bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.5)
8 mm hex bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head, small flange)	10 (1.0, 7)
10 mm hex bolt and nut	34 (3.5, 25)		
12 mm hex bolt and nut	54 (5.5, 40)	6 mm flange bolt (8 mm head, large flange)	12 (1.2, 9)
		6 mm flange bolt (10 mm head) and nut	12 (1.2, 9)
		8 mm flange bolt and nut	26 (2.7, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

- Torque specifications listed below are for specific fasteners.
- Other fasteners should be tightened to standard torque values listed above.

NOTES:
1. Apply sealant to the threads.
2. Apply a locking agent to the threads.
3. Stake.
4. Apply oil to the threads and flange surface.
5. U-nut.
6. ALOC bolt/screw: replace with a new one.
7. Apply grease to the threads.
8. Apply molybdenum disulfide oil to the threads and seating surface.
9. CT bolt.

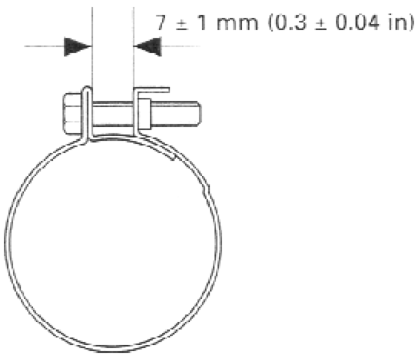
ENGINE

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N•m (kgf•m, lbf•ft)	REMARKS
MAINTENANCE:				
Spark plug	4	10	12 (1.2, 9)	
Timing hole cap	1	45	18 (1.8, 13)	NOTE 7
Engine oil filter cartridge	1	20	26 (2.7, 20)	NOTE 4
Engine oil drain bolt	1	12	29 (3.0, 22)	
LUBRICATION SYSTEM:				
Oil main gallery sealing bolt	2	20	29 (3.0, 22)	NOTE 2
Oil pump cover bolt	1	6	8 (0.8, 5.8)	NOTE 9
Oil cooler bolt (filter boss)	1	20	64 (6.5, 47)	NOTE 4
FUEL SYSTEM (Programmed Fuel Injection):				
ECT (Engine Coolant Temperature)/thermo sensor	1	12	23 (2.3, 17)	
Throttle body insulator band screw	8	5	See page 1-14	
Throttle cable bracket mounting bolt	2	5	3 (0.35, 2.5)	
Starter valve lock nut	4	10	2 (0.18, 1.3)	
Starter valve synchronization plate screw	4	3	1 (0.09, 0.7)	
Fast idle wax unit link plate screw	1	3	1 (0.09, 0.7)	
Fast idle wax unit mounting screw	2	6	5 (0.5, 3.6)	
Pressure regulator mounting bolt	2	6	10 (1.0, 7)	
Vacuum joint for synchronization	2	5	3 (0.3, 2.2)	
COOLING SYSTEM:				
Water pump cover flange bolt	2	6	12 (1.2, 9)	NOTE 9
Thermostat cover flange bolt	2	6	12 (1.2, 9)	NOTE 9
ENGINE MOUNTING:				
Drive sprocket special bolt	1	10	54 (5.5, 40)	

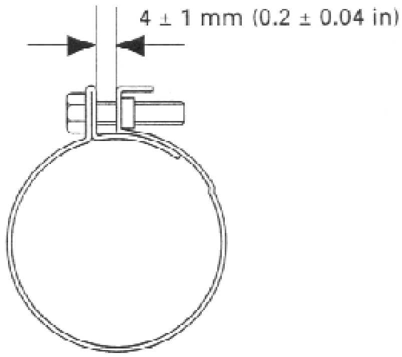
ENGINE (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
CYLINDER HEAD/VALVES:				
Cylinder head mounting bolt/washer	10	9	47 (4.8, 35)	NOTE 8
Camshaft holder flange bolt	20	6	12 (1.2, 9)	NOTE 4
Cylinder head sealing bolt	1	14	18 (1.8, 13)	NOTE 2
Cylinder head cover bolt	3	6	10 (1.0, 7)	
Breather plate flange bolt	3	6	12 (1.2, 9)	NOTE 2, 9
PAIR reed valve cover SH bolt	4	6	12 (1.2, 9)	NOTE 9
Cam sprocket flange dowel bolt	4	7	20 (2.0, 14)	NOTE 2
Cam pulse generator rotor flange dowel bolt	2	6	12 (1.2, 9)	NOTE 2
Cam chain lifter mounting socket bolt	2	6	10 (1.0, 7)	
Cam chain tensioner pivot socket bolt	1	6	10 (1.0, 7)	NOTE 2
Cam chain guide bolt/washer	1	6	12 (1.2, 9)	
Cylinder head stud bolt (exhaust pipe stud bolt)	8	6	See page 1-14	
CLUTCH/GEARSHIFT LINKAGE:				
Clutch center lock nut	1	22	127 (13.0, 94)	NOTE 3, 4
Clutch spring bolt/washer	5	6	12 (1.2, 9)	
Oil pump driven sprocket bolt/washer	1	6	15 (1.5, 11)	NOTE 2
Shift drum center socket bolt	1	8	23 (2.3, 17)	NOTE 2
Shift drum stopper arm pivot bolt	1	6	12 (1.2, 9)	
Gearshift spindle return spring pin	1	8	22 (2.2, 16)	
Ignition pulse generator wire guide bolt/washer	1	6	12 (1.2, 9)	
ALTERNATOR/STARTER CLUTCH:				
Alternator stator socket bolt	4	6	12 (1.2, 9)	
Starter clutch outer socket bolt	6	8	16 (1.6, 12)	NOTE 2
Flywheel flange bolt	1	10	103 (10.5, 76)	NOTE 4
Starter wire clamp flange bolt	1	6	12 (1.2, 9)	NOTE 9
CRANKCASE/TRANSMISSION:				
Mainshaft bearing set plate bolt	3	6	12 (1.2, 9)	NOTE 2
Gearshift drum bearing/fork shaft set bolt/washer	2	6	12 (1.2, 9)	NOTE 2
Crankcase bolt (main journal)	10	8	25 (2.6, 19)	NOTE 8
Crankcase bolt	1	10	39 (4.0, 29)	
Crankcase bolt	6	7	18 (1.8, 13)	
Crankcase bolt (upper side)	5	8	25 (2.5, 18)	
CRANKSHAFT/PISTON/CYLINDER:				
Connecting rod bearing cap nut	8	7	25 (2.6, 19)	NOTE 4
IGNITION SYSTEM:				
Ignition pulse generator rotor special bolt	1	10	59 (6.0, 43)	
ELECTRIC STARTER:				
Starter motor terminal nut	1	6	12 (1.2, 9)	
LIGHTS/METERS/SWITCHES:				
Oil pressure switch	1	PT 1/8	12 (1.2, 9)	NOTE 1
Oil pressure switch wire terminal bolt/washer	1	4	2 (0.2, 1.4)	
Neutral switch	1	10	12 (1.2, 9)	

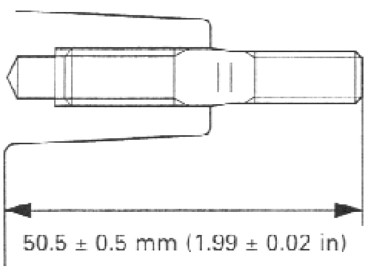
Insulator clamp (throttle body side):



Insulator clamp (cylinder head side):

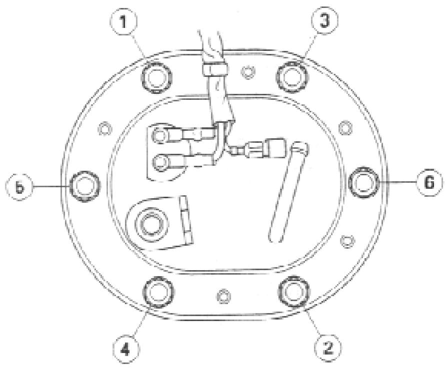


Exhaust pipe stud bolt:



FRAME

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
FRAME BODY PANELS/EXHAUST SYSTEM:				
Upper cowl-to-lower cowl screw	6	5	2 (0.15, 1.1)	
Inner half cowl-to-lower cowl screw	6	6	2 (0.15, 1.1)	
Windscreen setting screw	6	4	1 (0.05, 0.4)	
Seat rail upper mounting flange bolt/nut	2	10	49 (5.0, 36)	
Seat rail lower mounting flange bolt/nut	2	10	49 (5.0, 36)	
Exhaust pipe joint flange nut	8	7	12 (1.2, 9)	
Muffler band flange bolt	2	8	23 (2.3, 17)	
Passenger footpeg bracket flange bolt	4	8	26 (2.7, 20)	
FUEL SYSTEM (Programmed Fuel Injection):				
Fuel filler cap bolt	3	4	2 (0.18, 1.3)	
Service check bolt	1	6	15 (1.5, 11)	
Fuel hose banjo bolt (fuel tank side)	1	12	22 (2.2, 16)	
Fuel hose sealing nut (throttle body side)	1	12	22 (2.2, 16)	
Fuel pump mounting nut	6	6	12 (1.2, 9)	



ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
O_2 sensor (California type only)	1	12	25 (2.6, 19)	
COOLING SYSTEM:				
Cooling fan mounting nut	1	5	3 (0.27, 2.0)	NOTE 2
Fan motor mounting nut	3	5	5 (0.5, 3.6)	
ENGINE MOUNTING:				
Front engine hanger bolt	2	10	39 (4.0, 29)	See page 7-10
Center engine hanger bolt	2	10	39 (4.0, 29)	
Center engine hanger adjusting bolt	1	20	3 (0.3, 2.2)	
Center engine hanger lock nut	1	20	54 (5.5, 40)	
Rear engine hanger nut	1	10	39 (4.0, 29)	
Rear engine hanger adjusting bolt	1	22	3 (0.3, 2.2)	
Rear engine hanger lock nut (right side)	1	22	54 (5.5, 40)	
Shock link bracket nut	2	10	39 (4.0, 29)	
FRONT WHEEL/SUSPENSION/STEERING:				
Handlebar weight mounting screw	2	6	10 (1.0, 7)	NOTE 6
Front brake disc bolt	12	6	20 (2.0, 14)	NOTE 6
Front axle bolt	1	14	59 (6.0, 43)	
Front axle holder flange bolt	4	8	22 (2.2, 16)	
Front brake hose clamp flange bolt (left front)	1	6	12 (1.2, 9)	
Front brake hose 3-way joint flange bolt (right front)	1	6	12 (1.2, 9)	
Fork socket bolt	2	10	34 (3.5, 25)	NOTE 2
Fork bolt	2	39	23 (2.3, 17)	
Fork top bridge pinch socket bolt	2	8	23 (2.3, 17)	
Fork bottom bridge pinch flange bolt	2	10	39 (4.0, 29)	
Steering bearing adjusting nut	1	26	25 (2.5, 18)	See page 13-29
Steering bearing adjusting nut lock nut	1	26	—	
Steering stem nut	1	24	103 (10.5, 76)	
Front brake hose clamp bolt (steering stem)	1	6	10 (1.0, 7)	

FRAME (Cont'd)

ITEM	Q'TY	THREAD DIA. (mm)	TORQUE N·m (kgf·m, lbf·ft)	REMARKS
REAR WHEEL/SUSPENSION:				
Rear brake disc bolt	4	8	42 (4.3, 31)	NOTE 6
Final driven sprocket nut	6	10	64 (6.5, 47)	NOTE 5
Rear axle nut	1	18	93 (9.5, 69)	NOTE 5
Rear shock absorber mounting nut	2	10	44 (4.5, 33)	NOTE 5
Shock link plate-to-swingarm nut	1	10	44 (4.5, 33)	NOTE 5
Shock link-to-shock link plate nut	1	10	44 (4.5, 33)	NOTE 5
Shock link-to-bracket nut	1	10	44 (4.5, 33)	NOTE 5
Drive chain slider flange bolt	2	6	9 (0.9, 6.5)	NOTE 6
Swingarm pivot adjusting bolt	2	30	7 (0.7, 5.1)	See page 14-22
Swingarm pivot adjusting bolt lock nut	2	30	64 (6.5, 47)	
Swingarm pivot nut	1	18	93 (9.5, 69)	
HYDRAULIC BRAKE:				
Front master cylinder reservoir cap screw	2	4	2 (0.2, 1.4)	
Front brake lever pivot bolt	1	6	1 (0.1, 0.7)	
Front brake lever pivot nut	1	6	6 (0.6, 4.3)	
Front brake light switch screw	1	4	1 (0.1, 0.7)	
Front master cylinder mounting bolt	2	6	12 (1.2, 9)	
Front brake caliper assembly torx bolt	8	8	23 (2.3, 17)	NOTE 2
Front brake caliper mounting flange bolt	4	8	30 (3.1, 22)	NOTE 6
Rear master cylinder push rod joint nut	1	8	18 (1.8, 13)	
Rear master cylinder mounting bolt	2	6	9 (0.9, 6.5)	
Rear brake reservoir mounting bolt/nut	1	6	12 (1.2, 9)	
Rear brake caliper bolt	1	8	23 (2.3, 17)	
Rear brake caliper pin bolt	1	12	27 (2.8, 20)	
Pad pin	5	10	18 (1.8, 13)	
Pad pin plug	1	10	3 (0.3, 2.2)	
Brake hose oil bolt	5	10	34 (3.5, 25)	
Brake caliper bleeder valve	3	8	6 (0.6, 4.3)	
LIGHTS/METERS/SWITCHES:				
Side stand switch bolt	1	6	10 (1.0, 7)	NOTE 6
Ignition switch mounting bolt	2	8	25 (2.5, 18)	
Fan motor switch	1	16	18 (1.8, 13)	NOTE 1
OTHERS:				
Side stand pivot bolt	1	10	10 (1.0, 7)	
Side stand pivot lock nut	1	10	29 (3.0, 22)	
Side stand bracket flange bolt	2	10	44 (4.5, 33)	NOTE 6
Driver footpeg bracket socket bolt	4	8	26 (2.7, 20)	

TOOLS

NOTES: 1. Equivalent commercially available in U.S.A.
2. Not available in U.S.A.
3. Alternative tool.
4. Newly designed tool.

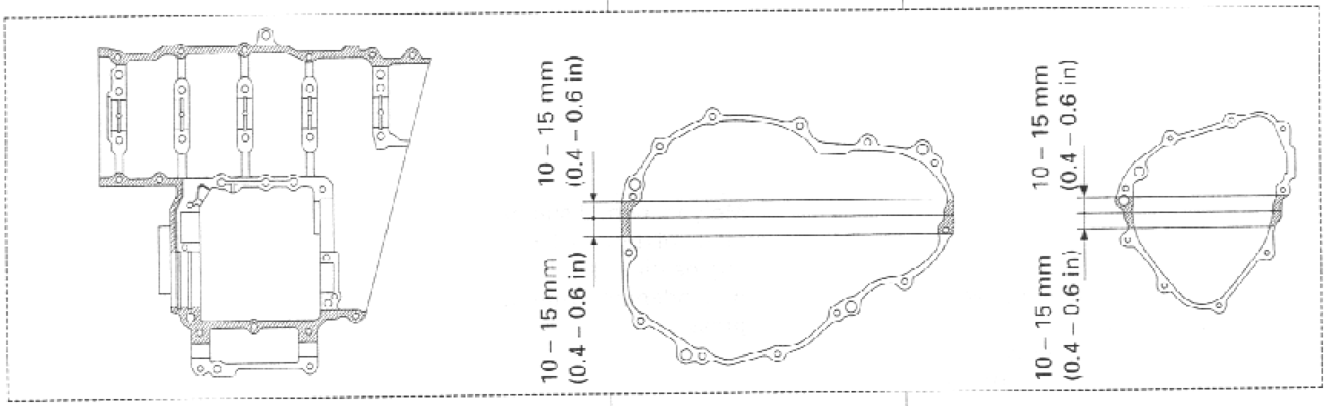
DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Fuel pressure gauge	07406–0040003	NOTE 3: 07406–0040002	5
Oil pressure gauge set	07506–3000000	NOTE 1	4
Oil pressure gauge attachment	07510–MJ10100	NOTE 1	4
Universal bearing puller	07631–0010000	NOTE 1	12
Clutch center holder	07724–0050002	NOTE 1	9
Flywheel holder	07725–0040000	NOTE 1	10
Rotor puller	07733–0020001	NOTE 3: 07933–3950000	10
Remover weight	07741–0010201	NOTE 3: 07916–371020A (U.S.A. only)	14
Attachment, 32 x 35 mm	07746–0010100		9, 14
Attachment, 37 x 40 mm	07746–0010200		9, 14
Attachment, 42 x 47 mm	07746–0010300		13, 14
Attachment, 52 x 55 mm	07746–0010400		14
Attachment, 24 x 26 mm	07746–0010700		14
Attachment, 22 x 24 mm	07746–0010800		14
Inner driver C	07746–0030100		11
Attachment, 25 mm I.D.	07746–0030200		12
Attachment, 30 mm I.D.	07746–0030300		11
Pilot, 17 mm	07746–0040400		9, 14
Pilot, 20 mm	07746–0040500		13, 14
Pilot, 25 mm	07746–0040600		14
Pilot, 35 mm	07746–0040800		9
Pilot, 28 mm	07746–0041100		14
Bearing remover shaft	07746–0050100		13, 14
Bearing remover head, 20 mm	07746–0050600		13, 14
Driver	07749–0010000		9, 13, 14
Valve spring compressor	07757–0010000		8
Valve seat cutter		NOTE 1	8
Seat cutter, 24.5 mm (45° EX)	07780–0010100		
Seat cutter, 27.5 mm (45° IN)	07780–0010200		
Flat cutter, 24 mm (32° EX)	07780–0012500		
Flat cutter, 27 mm (32° IN)	07780–0013300		
Interior cutter, 22 mm (60° EX)	07780–0014202		
Interior cutter, 26 mm (60° IN)	07780–0014500		
Cutter holder, 4.0 mm	07781–0010500		
Lock nut wrench	07908–4690003		14
Snap ring pliers	07914–SA50001		15
Steering stem socket	07916–3710101	NOTE 4: 07916–3710100	13
Bearing remover handle	07936–3710100		14
Bearing remover head	07936–3710600		14
Attachment, 28 x 30 mm	07946–1870100		14
Ball race remover set	07946–KM90001	NOTE 3:	13
– Driver attachment, A	07946–KM90100	Can be used with the following	
– Driver attachment, B	07946–KM90200	combination (U.S.A. only):	
– Driver shaft assembly	07946–KM90300	07VMF–MAT0100	
– Bearing remover, A	07946–KM90401	07VMF–MAT0200	
– Bearing remover, B	07946–KM90500	07VMF–KZ30200	
– Assembly base	07946–KM90600	07VMF–MAT0300	
		07VMF–MAT0400	
		07947–KA50100	
		07965–MA60000	
		07946–ME90200	
Steering stem driver	07946–MB00000		13
Fork seal driver weight	07947–KA50100		13
Fork seal driver attachment	07946–KA40200		13
Driver	07949–3710001	NOTE 3: 07946–MJ00100	14

DESCRIPTION	TOOL NUMBER	REMARKS	REF. SEC.
Valve spring compressor attachment	07959–KM30101		8
Oil filter wrench	07HAA–PJ70100		3
Peak voltage adaptor	07HGJ–0020100		5, 17, 19
Tappet hole protector	07HMG–MR70002		8
Drive chain tool set	07HMH–MR10103	NOTE 3: 07HMH–MR1010B (U.S.A. only)	3
Valve guide driver	07JMD–KY20100		8
Bearing remover set	07LMC–KV30100		14
Valve guide reamer, 4.008 mm	07MMH–MV90100	NOTE3: 07MMH–WV9010A (U.S.A. only)	8
Compression gauge attachment	07RMJ–MY50100	NOTE 1	8
Lock nut wrench	07VMA–MBB0100	NOTE 3: 07VMA–MBB0101	7
ECM test harness	07YMZ–0010100	Two required	5
Attachment, 34 mm	07ZMD–MBW0100	NOTE 4	14
Attachment, 37 mm	07ZMD–MBW0200	NOTE 4 NOTE 3: 07746–0010100 (for swingarm right pivot radial ball bearing installation) NOTE 3: 07946–MJ00100 with 07HMC–MR70100 (for swingarm left pivot needle bearing removal) NOTE 3: 07746–0010200 (for swingarm left pivot needle bearing installation)	14

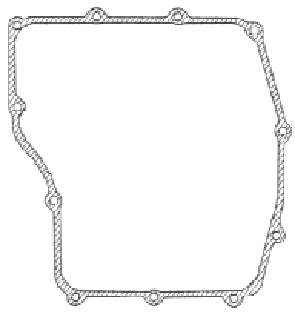
LUBRICATION & SEAL POINTS

ENGINE

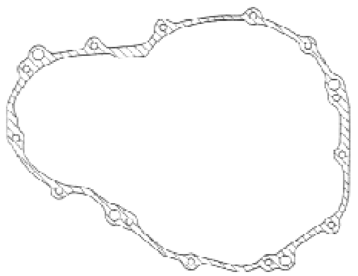
LOCATION	MATERIAL	REMARKS
Crankcase mating surface	Liquid sealant (Three Bond 1207B or equivalent)	



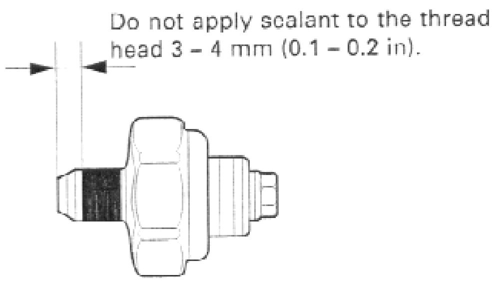
Oil pan mating surface



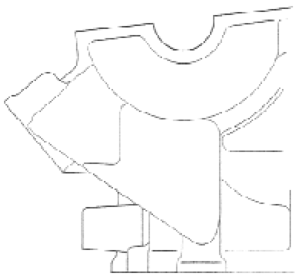
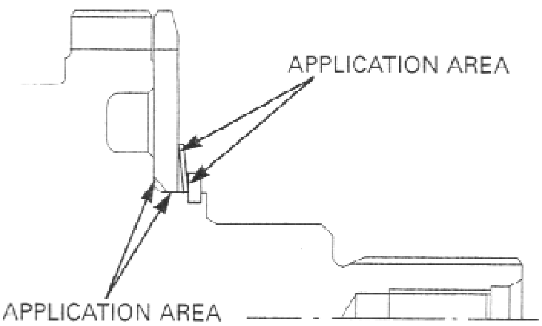
Right crankcase cover mating surface



Oil pressure switch threads



ENGINE (Cont'd)

LOCATION	MATERIAL	REMARKS
Cylinder head semi-circular cut-out 	Sealant	
Main journal bearing surface Piston pin sliding surface Connecting rod bearing surface Connecting rod small end inner surface Crankshaft thrust surface Camshaft lobes/journals and thrust surface Valve stem (valve guide sliding surface) Valve lifter outer sliding surface Water pump shaft spline and thrust washer sliding surface Clutch outer/primary driven gear sliding surface Clutch outer guide sliding surface M3/4, C5, C6 shifter gear (shift fork grooves) Starter reduction gear shaft outer surface Primary sub-gear friction spring sliding surface 	Molybdenum disulfide oil (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease	
Piston ring sliding area Oil strainer packing Clutch disc surface Starter one way clutch sliding surface Connecting rod nut threads Flywheel bolt threads and seating surface Main journal 9-mm bolt threads and seating surface (after removing anti-rust oil additive) Cylinder head special bolt (after removing anti-rust oil additive) Clutch center lock nut threads Oil filter cartridge threads and O-ring Camshaft holder bolt threads and seating surface Oil cooler center bolt threads Each gear teeth and rotating surface Each bearing Each O-ring Other rotating area and sliding surface	Engine oil	

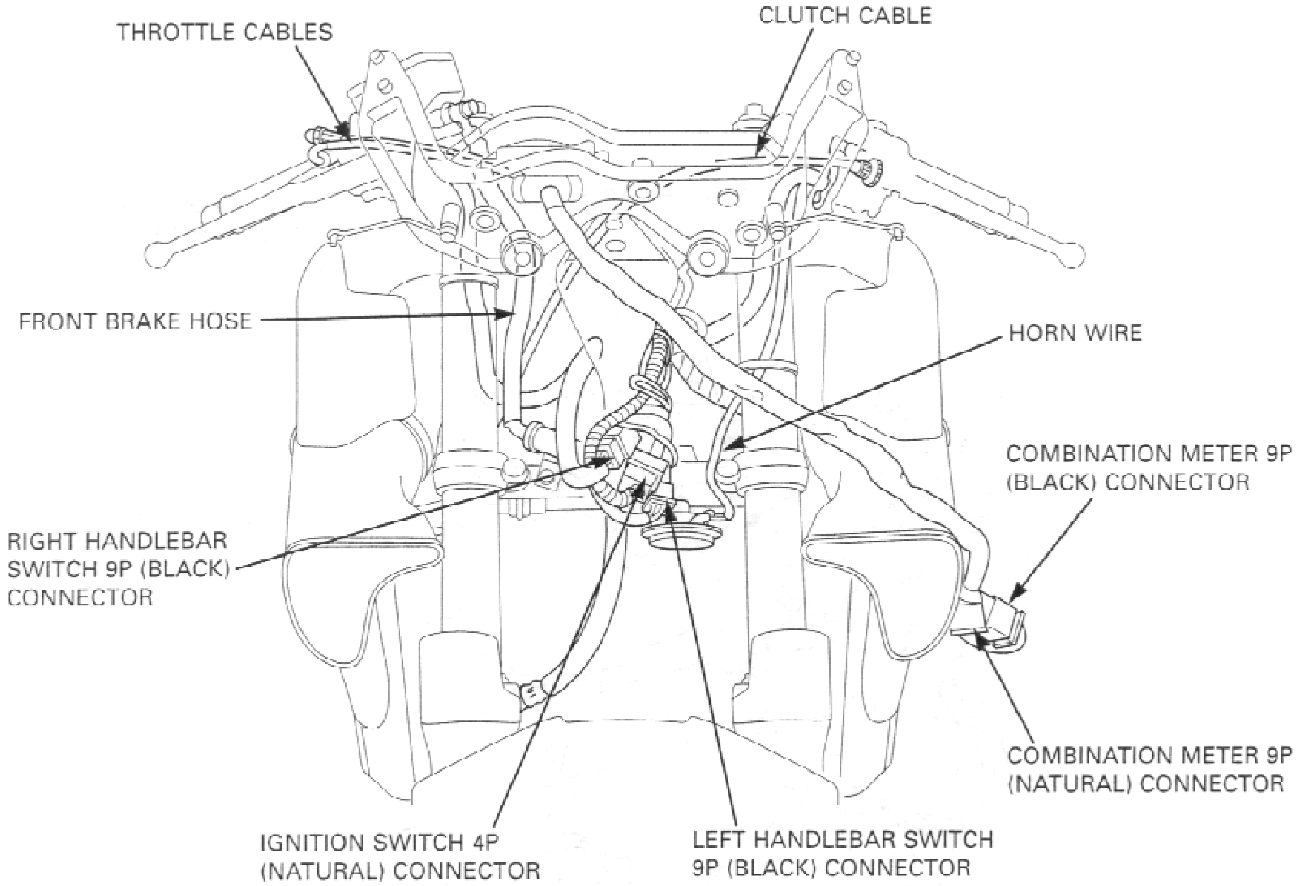
ENGINE (Cont'd)

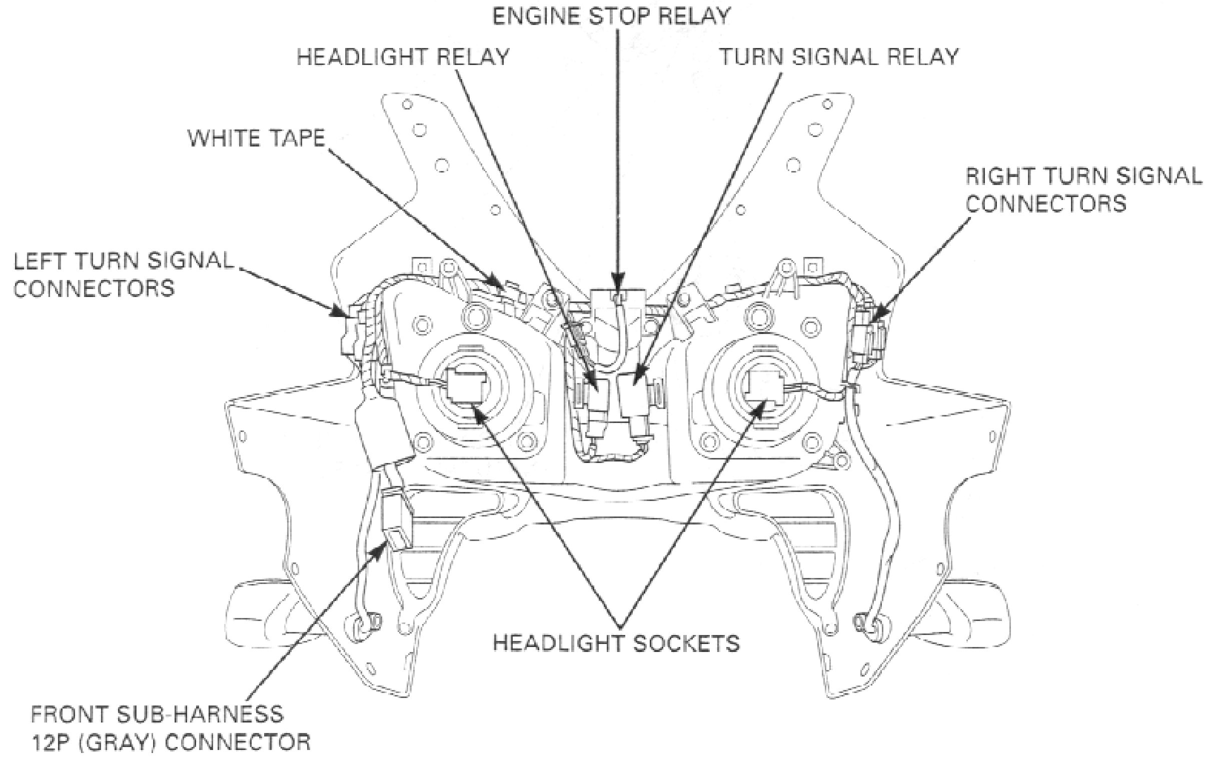
LOCATION	MATERIAL	REMARKS
Timing hole cap threads Each oil seal lips	Multi purpose grease	
Upper crankcase sealing bolt threads Lower crankcase sealing bolt threads Cylinder head sealing bolt threads Cylinder head cover breather joint threads Cylinder head sealing bolt threads Cam pulse generator rotor bolt threads Starter one-way clutch outer bolt threads Oil pump driven sprocket bolt threads Shift drum bearing set plate bolt threads Mainshaft bearing set plate bolt threads Cam sprocket bolt threads Cylinder head cover breather plate bolt threads Shift drum center bolt threads Cam chain tensioner pivot bolt threads Spindle plate tightening bolt threads	Locking agent	Coating width: 6.5 ± 1 mm

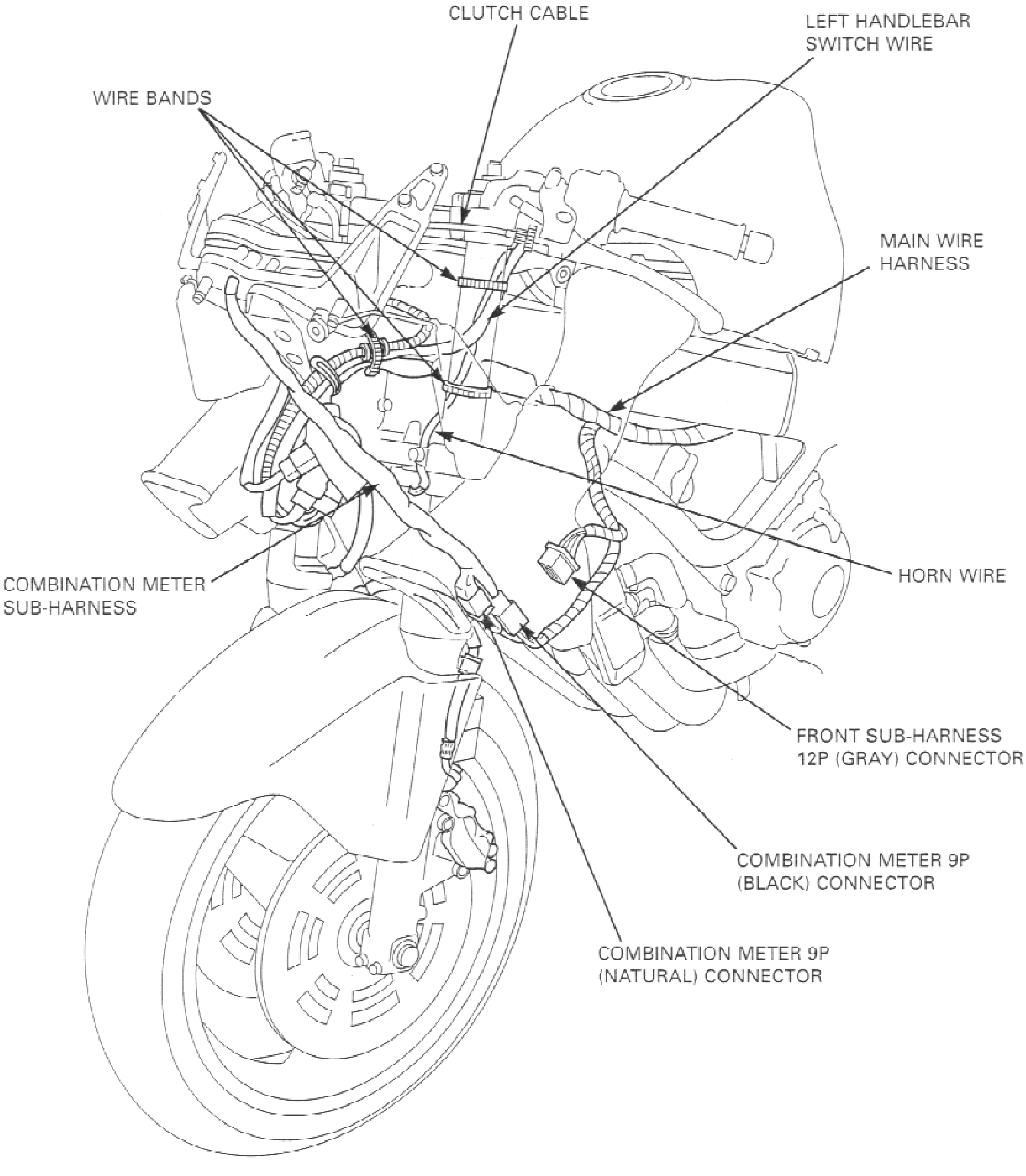
FRAME

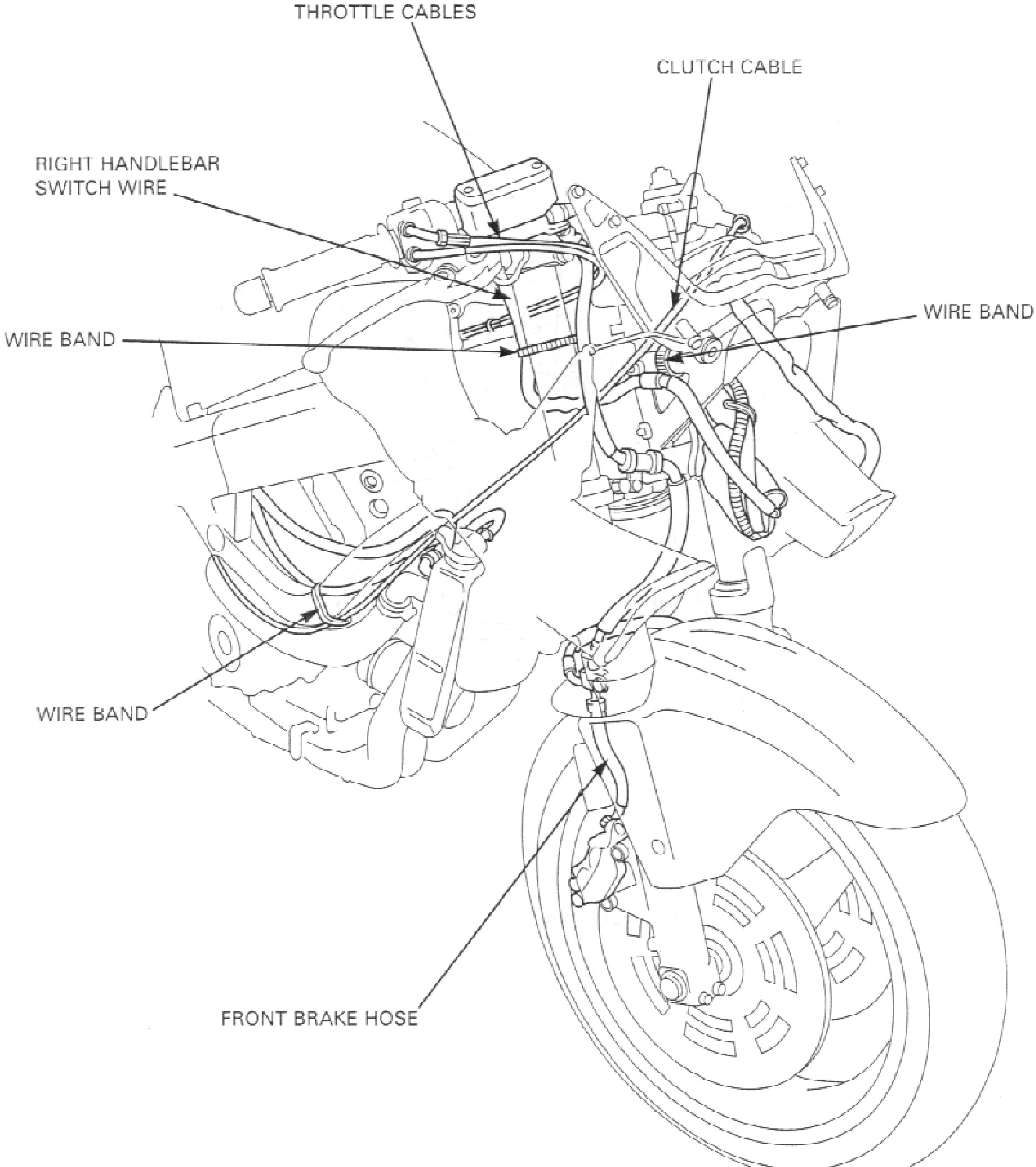
LOCATION	MATERIAL	REMARKS
Seat catch hook sliding area Front wheel dust seal lips Final driven flange-to-rear wheel hub mating surface and O-ring Rear wheel dust seal lips Rear wheel side collar inner surface Throttle grip pipe flange Clutch lever pivot bolt sliding area Rear brake pedal pivot sliding area Gearshift pedal link tie-rod ball joints Gearshift pedal pivot Rider footpeg sliding area Pillion footpeg sliding area Side stand pivot Center stand pivot	Multi-purpose grease	
Steering head bearing sliding surface Steering head dust seal lips Swingarm pivot bearings Swingarm pivot dust seal lips Shock arm and shock link needle bearings Shock arm and shock link dust seal lips Shock absorber needle bearings Shock absorber dust seal lips	Multi-purpose grease (Shell Alvania EP2 or equivalent)	
Throttle cable A, B outer inside Clutch cable outer inside Clutch cable outer inside	Cable lubricant	
Handlebar grip rubber inside	Honda Bond A or Honda Hand Grip Cement (U.S.A. only)	
Steering bearing adjustment nut threads	Engine oil	
Front brake lever-to-master piston contacting area Front brake lever pivot Rear master brake master piston-to-push rod contacting area Brake caliper dust seals Rear brake caliper boot inside Rear brake caliper pin boot inside	Silicone grease	
Brake master piston and cups Brake caliper piston and piston seals	DOT 4 brake fluid	
Fork cap O-ring Fork dust seal and oil seal lips	Fork fluid	
Rear brake reservoir hose joint screw threads Front brake caliper assembly bolt threads Rear brake caliper pin bolt threads	Locking agent	

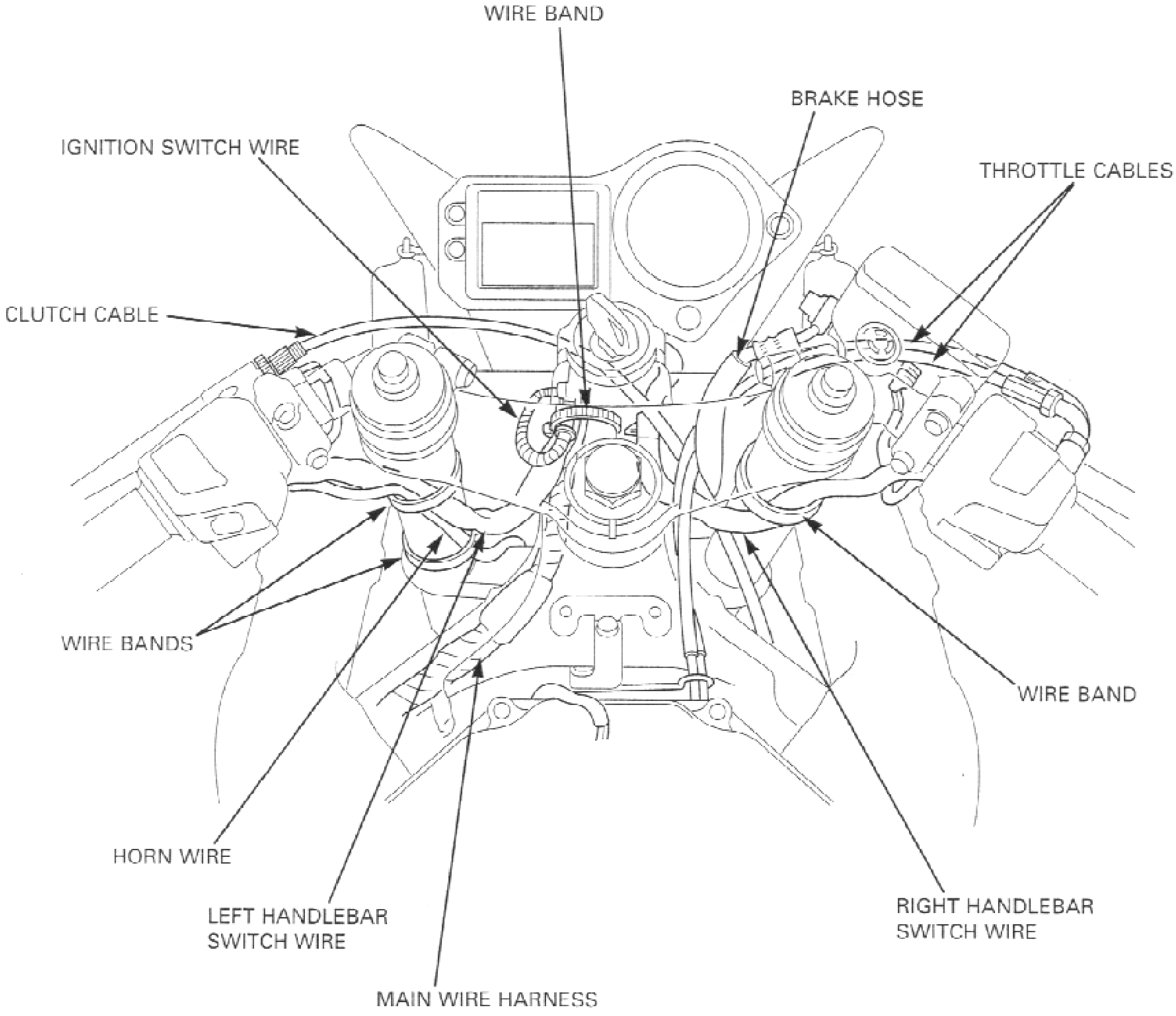
CABLE & HARNESS ROUTING

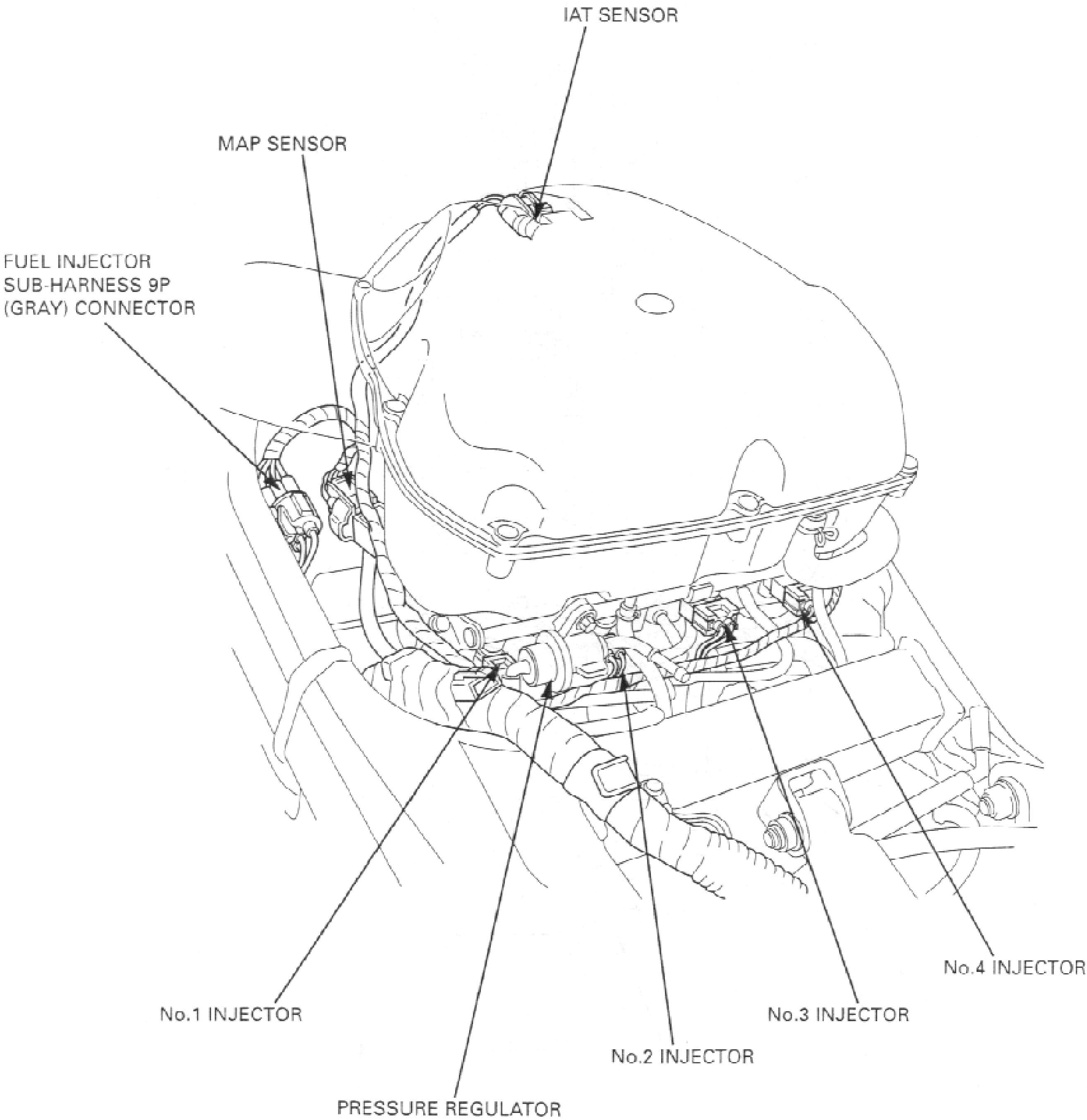


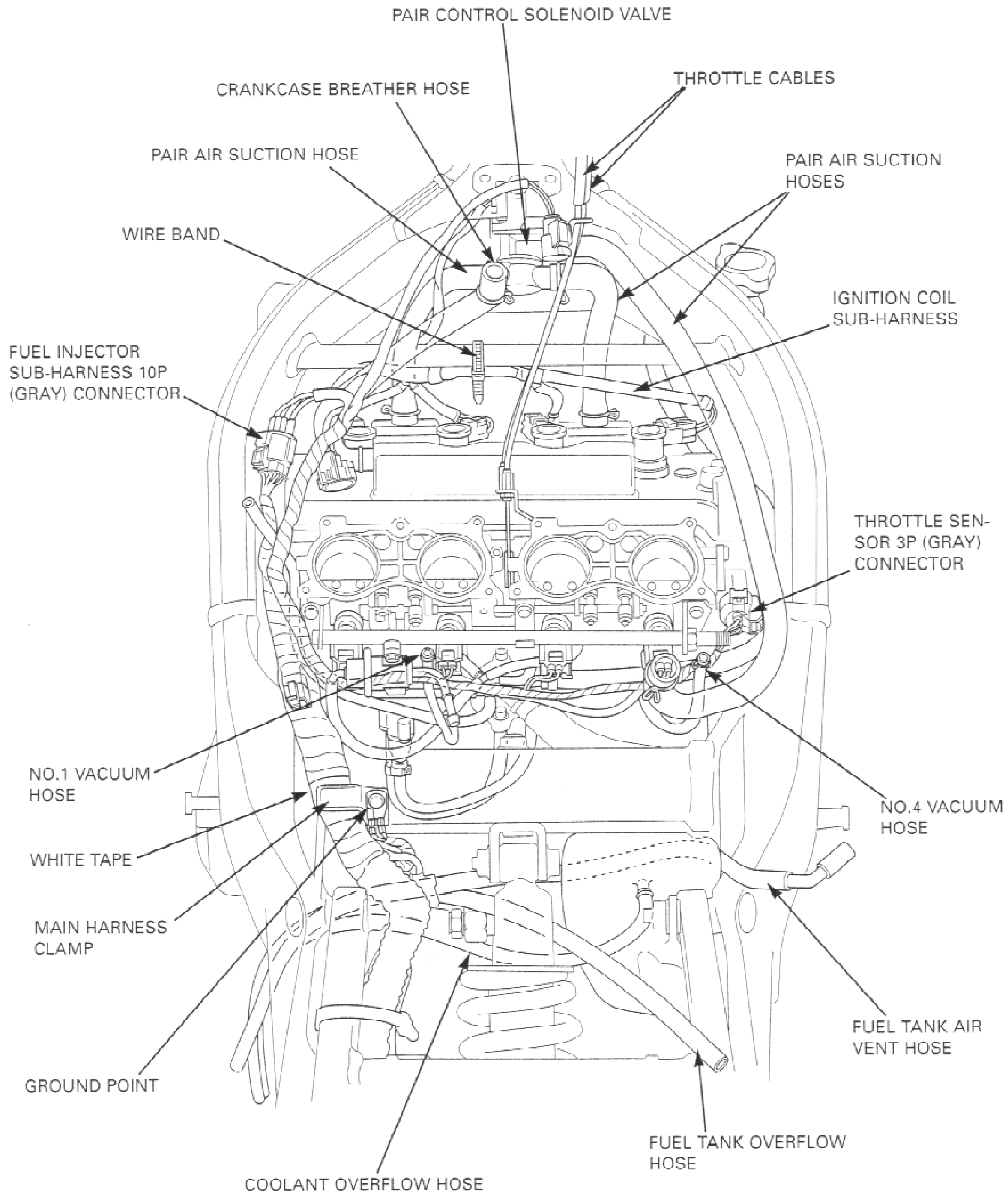


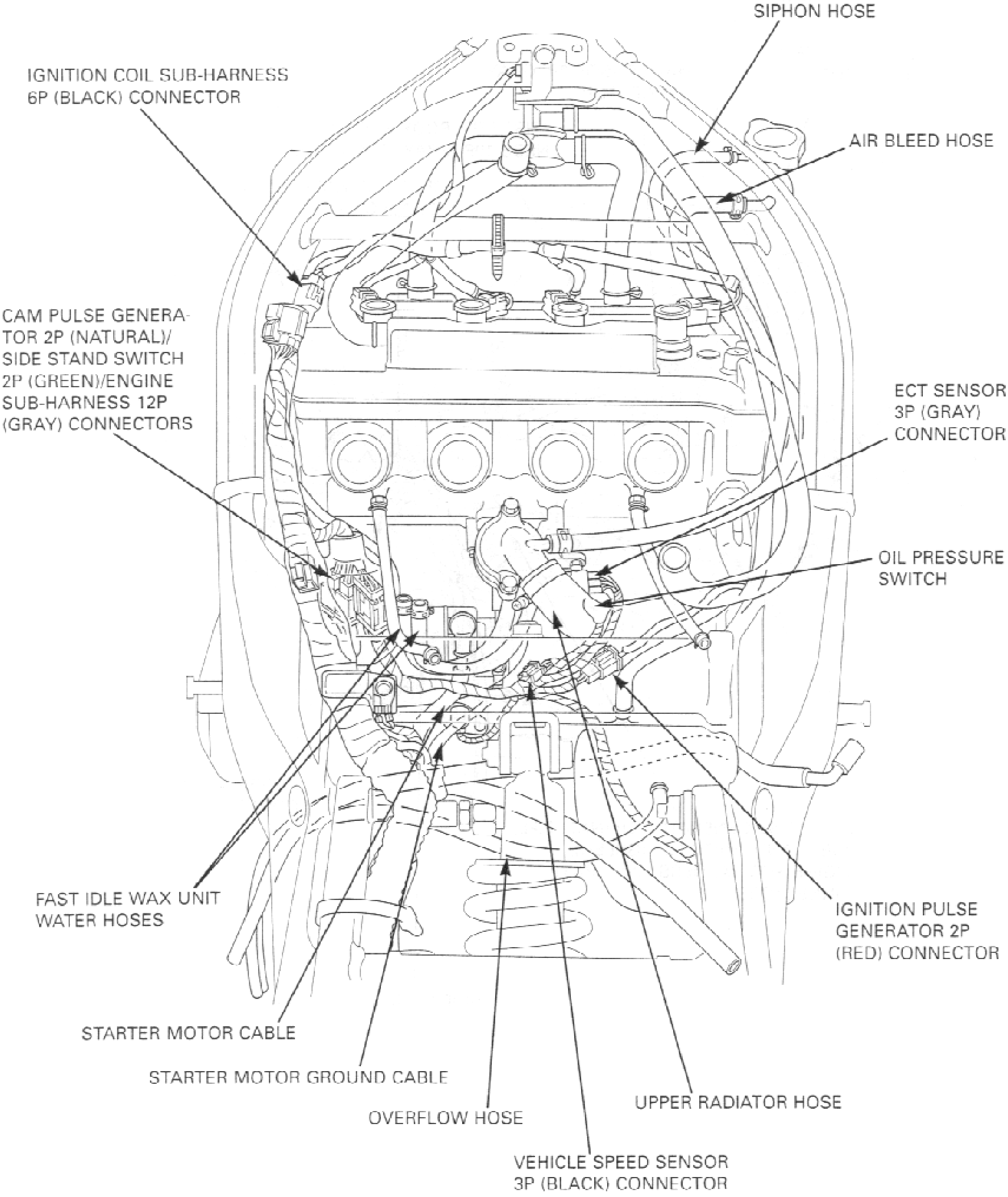

CLUTCH CABLE
LEFT HANDLEBAR SWITCH WIRE
WIRE BANDS
MAIN WIRE HARNESS
COMBINATION METER SUB-HARNESS
HORN WIRE
FRONT SUB-HARNESS 12P (GRAY) CONNECTOR
COMBINATION METER 9P (BLACK) CONNECTOR
COMBINATION METER 9P (NATURAL) CONNECTOR

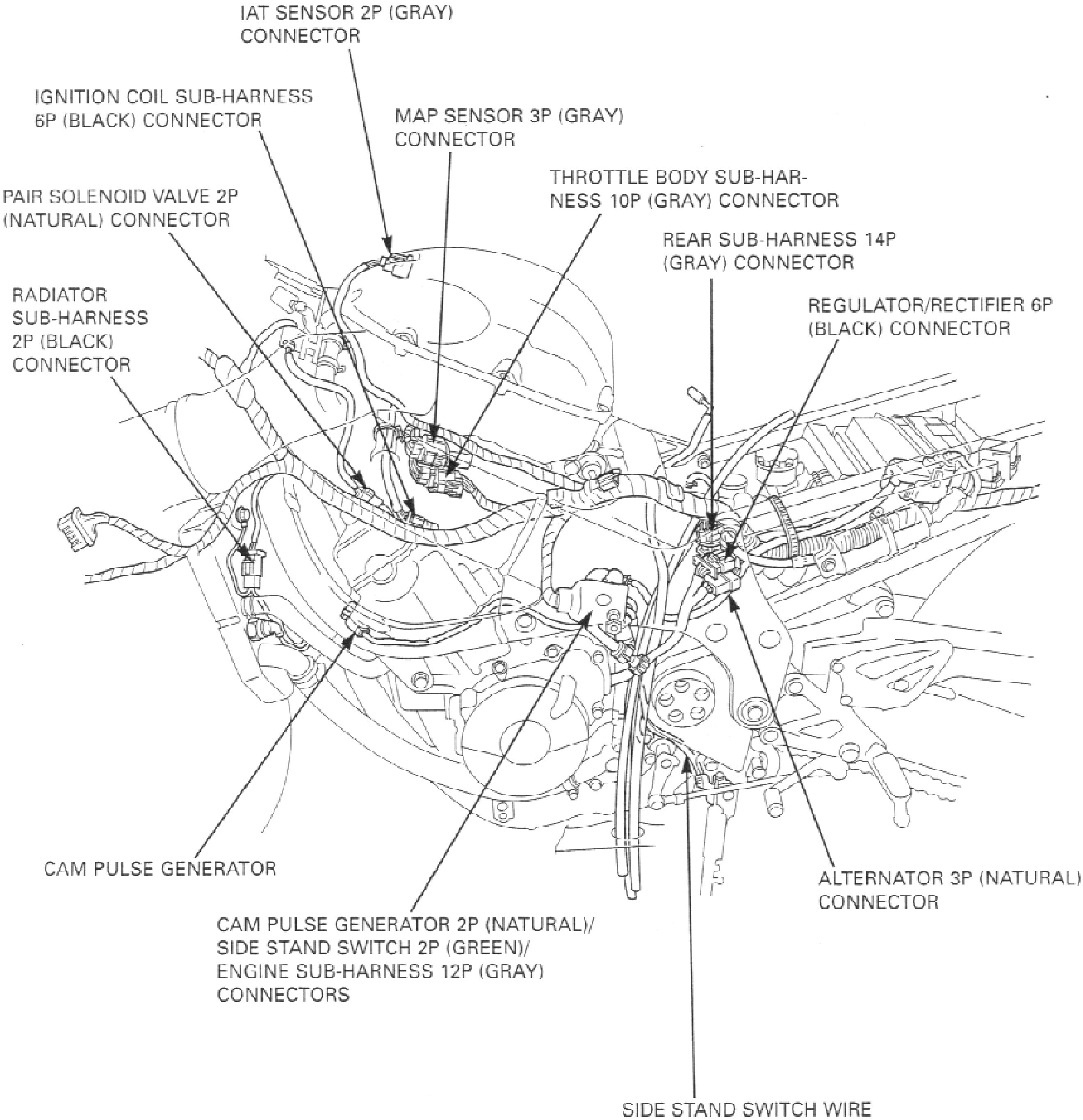

THROTTLE CABLES
CLUTCH CABLE
RIGHT HANDLEBAR SWITCH WIRE
WIRE BAND
WIRE BAND
WIRE BAND
FRONT BRAKE HOSE

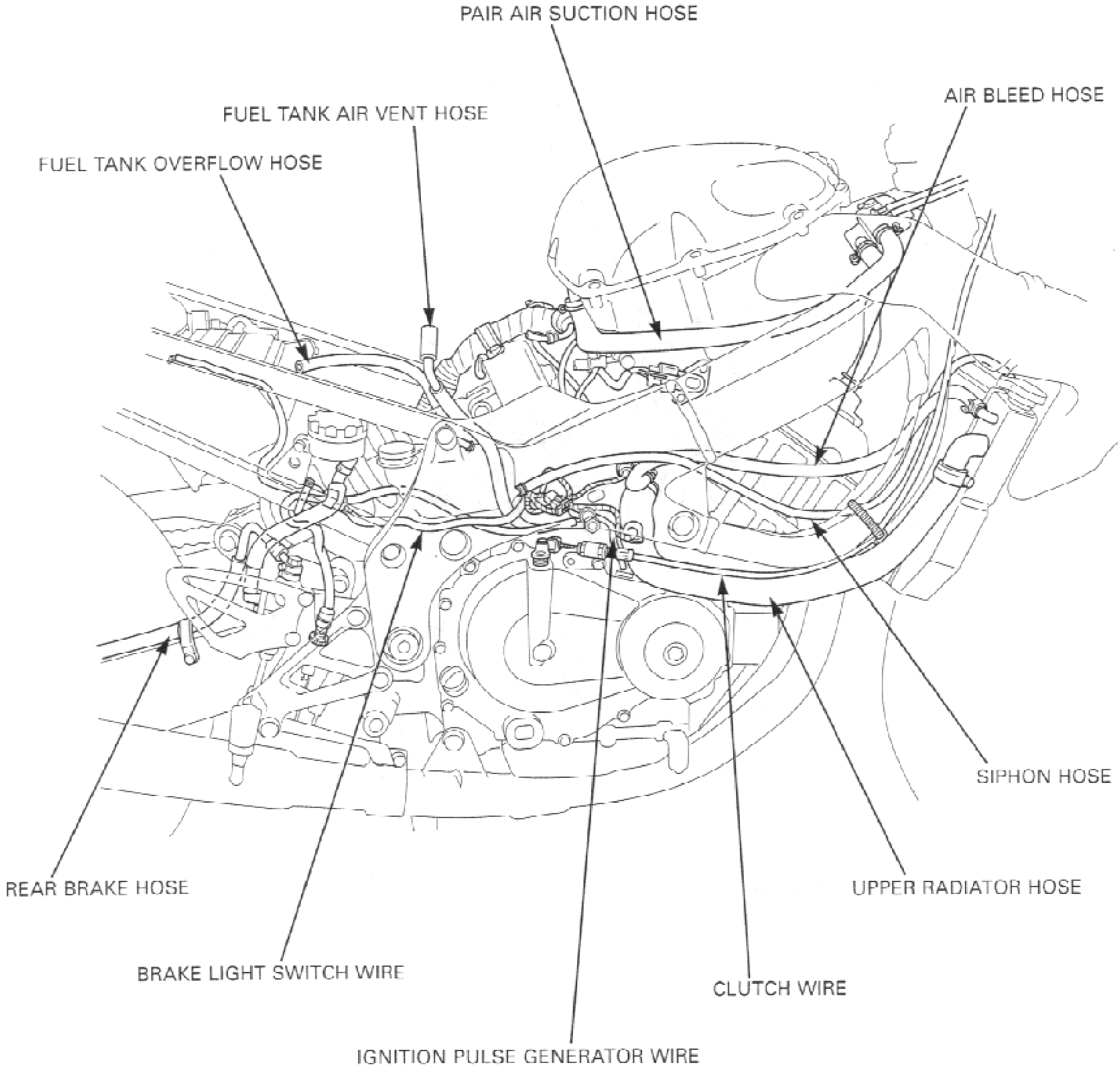

WIRE BAND
BRAKE HOSE
IGNITION SWITCH WIRE
THROTTLE CABLES
CLUTCH CABLE
WIRE BANDS
WIRE BAND
HORN WIRE
LEFT HANDLEBAR SWITCH WIRE
RIGHT HANDLEBAR SWITCH WIRE
MAIN WIRE HARNESS

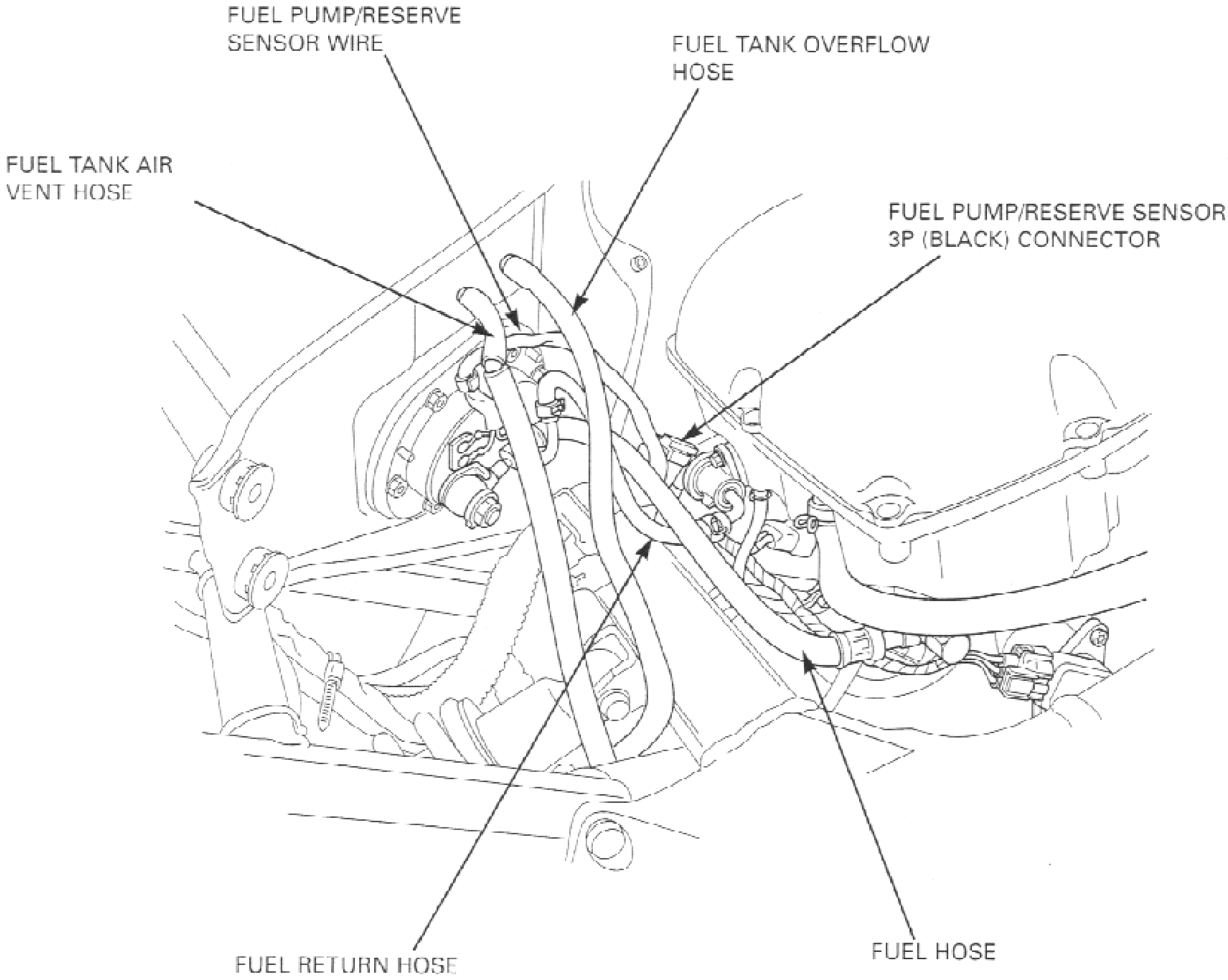

IAT SENSOR
MAP SENSOR
FUEL INJECTOR
SUB-HARNESS 9P
(GRAY) CONNECTOR
No.4 INJECTOR
No.1 INJECTOR
No.3 INJECTOR
No.2 INJECTOR
PRESSURE REGULATOR

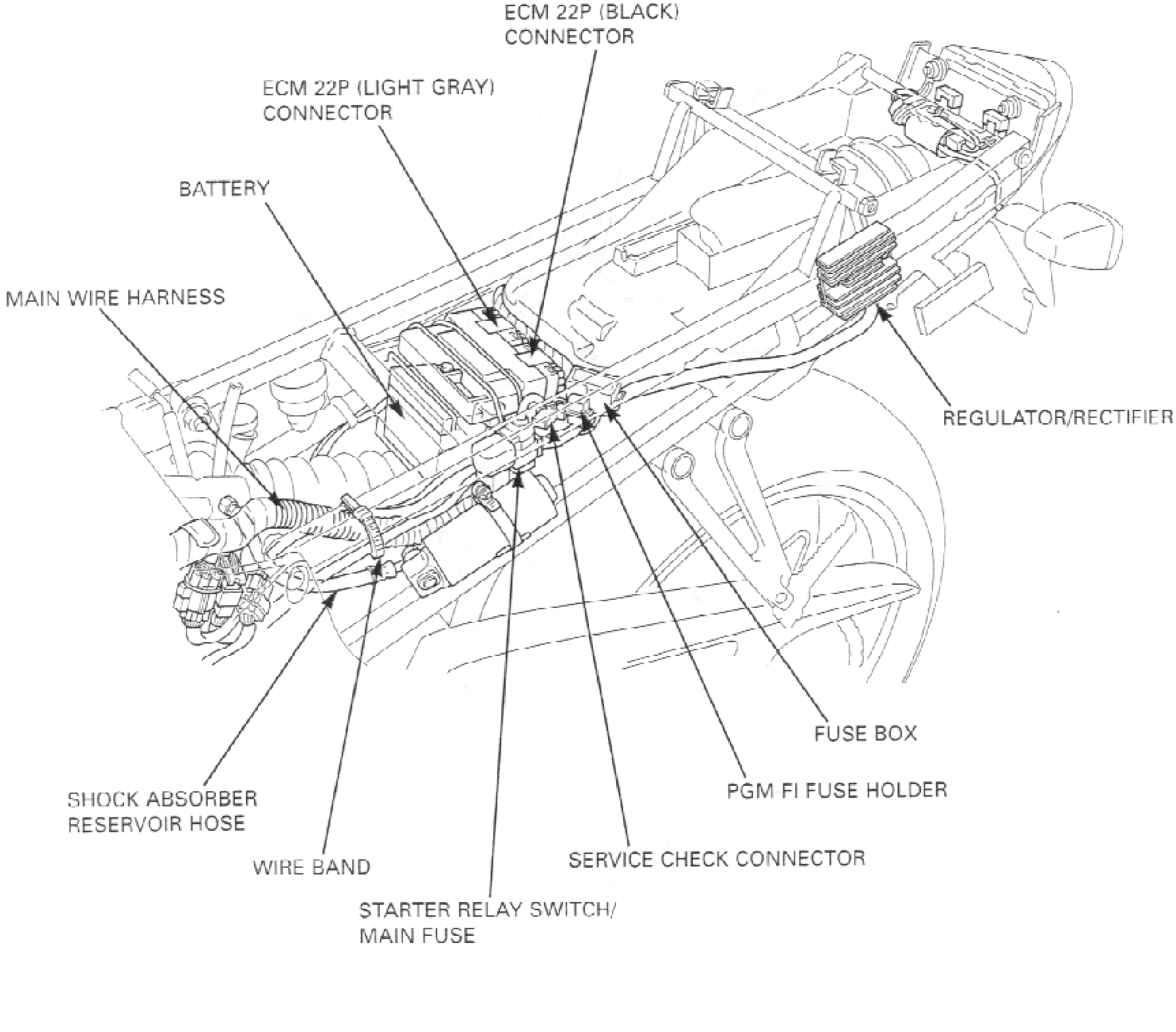

PAIR CONTROL SOLENOID VALVE
CRANKCASE BREATHER HOSE
THROTTLE CABLES
PAIR AIR SUCTION HOSE
PAIR AIR SUCTION HOSES
WIRE BAND
IGNITION COIL SUB-HARNESS
FUEL INJECTOR SUB-HARNESS 10P (GRAY) CONNECTOR
THROTTLE SENSOR 3P (GRAY) CONNECTOR
NO.1 VACUUM HOSE
WHITE TAPE
NO.4 VACUUM HOSE
MAIN HARNESS CLAMP
FUEL TANK AIR VENT HOSE
GROUND POINT
FUEL TANK OVERFLOW HOSE
COOLANT OVERFLOW HOSE

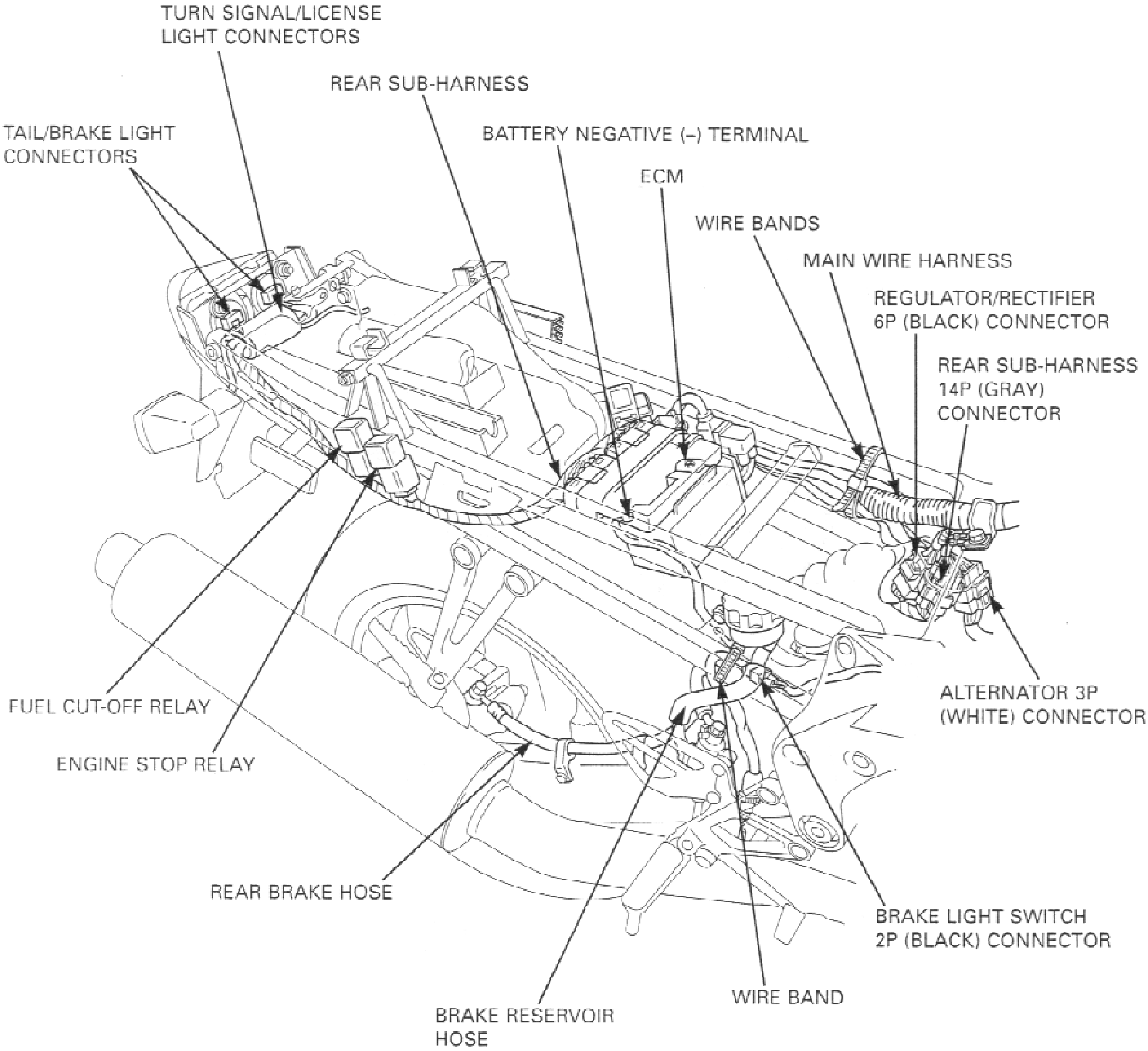

SIPHON HOSE
IGNITION COIL SUB-HARNESS 6P (BLACK) CONNECTOR
AIR BLEED HOSE
CAM PULSE GENERATOR 2P (NATURAL)/ SIDE STAND SWITCH 2P (GREEN)/ENGINE SUB-HARNESS 12P (GRAY) CONNECTORS
ECT SENSOR 3P (GRAY) CONNECTOR
OIL PRESSURE SWITCH
FAST IDLE WAX UNIT WATER HOSES
IGNITION PULSE GENERATOR 2P (RED) CONNECTOR
STARTER MOTOR CABLE
STARTER MOTOR GROUND CABLE
UPPER RADIATOR HOSE
OVERFLOW HOSE
VEHICLE SPEED SENSOR 3P (BLACK) CONNECTOR


IAT SENSOR 2P (GRAY) CONNECTOR
IGNITION COIL SUB-HARNESS 6P (BLACK) CONNECTOR
MAP SENSOR 3P (GRAY) CONNECTOR
THROTTLE BODY SUB-HARNESS 10P (GRAY) CONNECTOR
PAIR SOLENOID VALVE 2P (NATURAL) CONNECTOR
REAR SUB-HARNESS 14P (GRAY) CONNECTOR
REGULATOR/RECTIFIER 6P (BLACK) CONNECTOR
RADIATOR SUB-HARNESS 2P (BLACK) CONNECTOR
CAM PULSE GENERATOR
ALTERNATOR 3P (NATURAL) CONNECTOR
CAM PULSE GENERATOR 2P (NATURAL)/
SIDE STAND SWITCH 2P (GREEN)/
ENGINE SUB-HARNESS 12P (GRAY)
CONNECTORS
SIDE STAND SWITCH WIRE

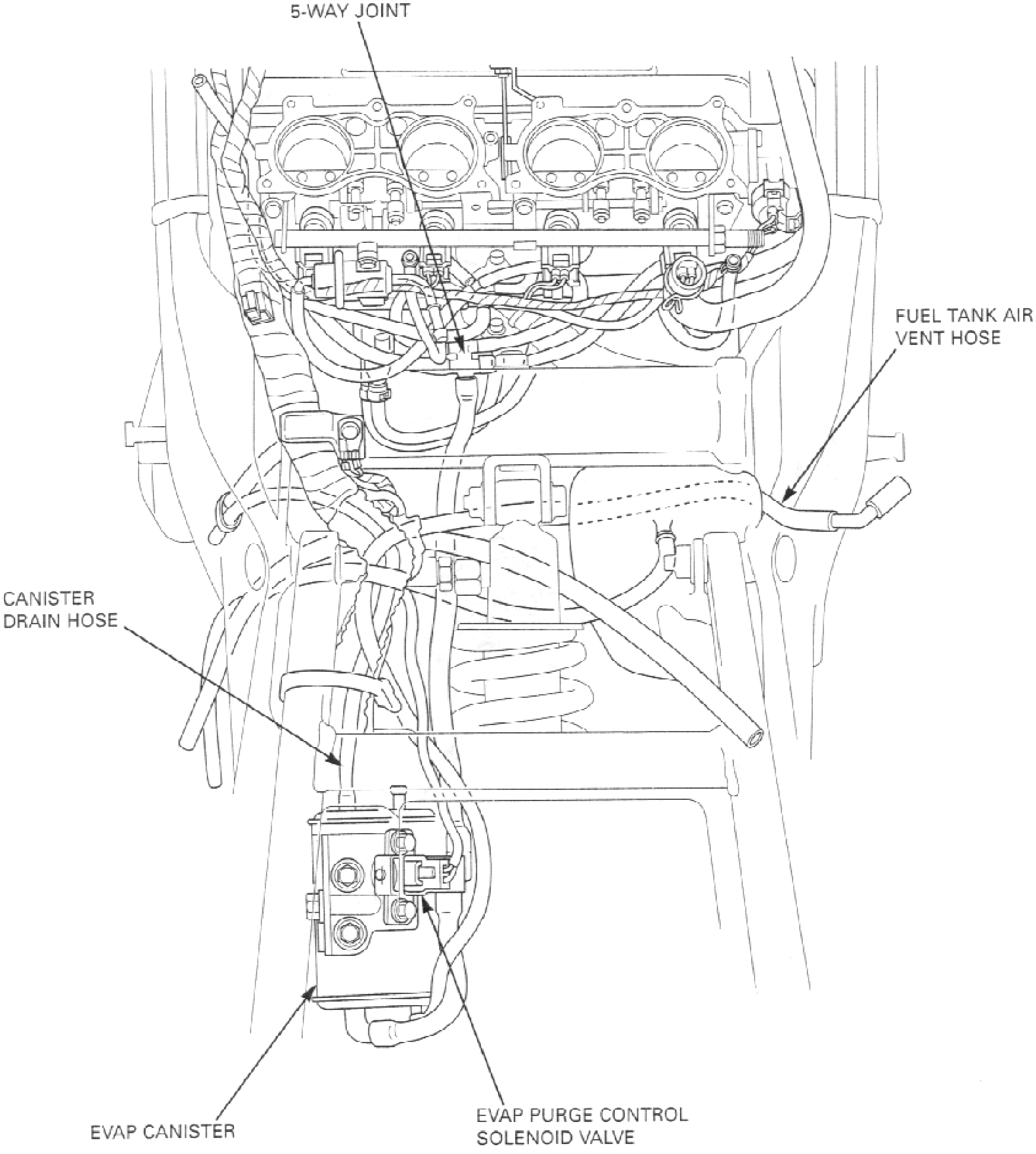

PAIR AIR SUCTION HOSE
AIR BLEED HOSE
FUEL TANK AIR VENT HOSE
FUEL TANK OVERFLOW HOSE
SIPHON HOSE
REAR BRAKE HOSE
UPPER RADIATOR HOSE
BRAKE LIGHT SWITCH WIRE
CLUTCH WIRE
IGNITION PULSE GENERATOR WIRE

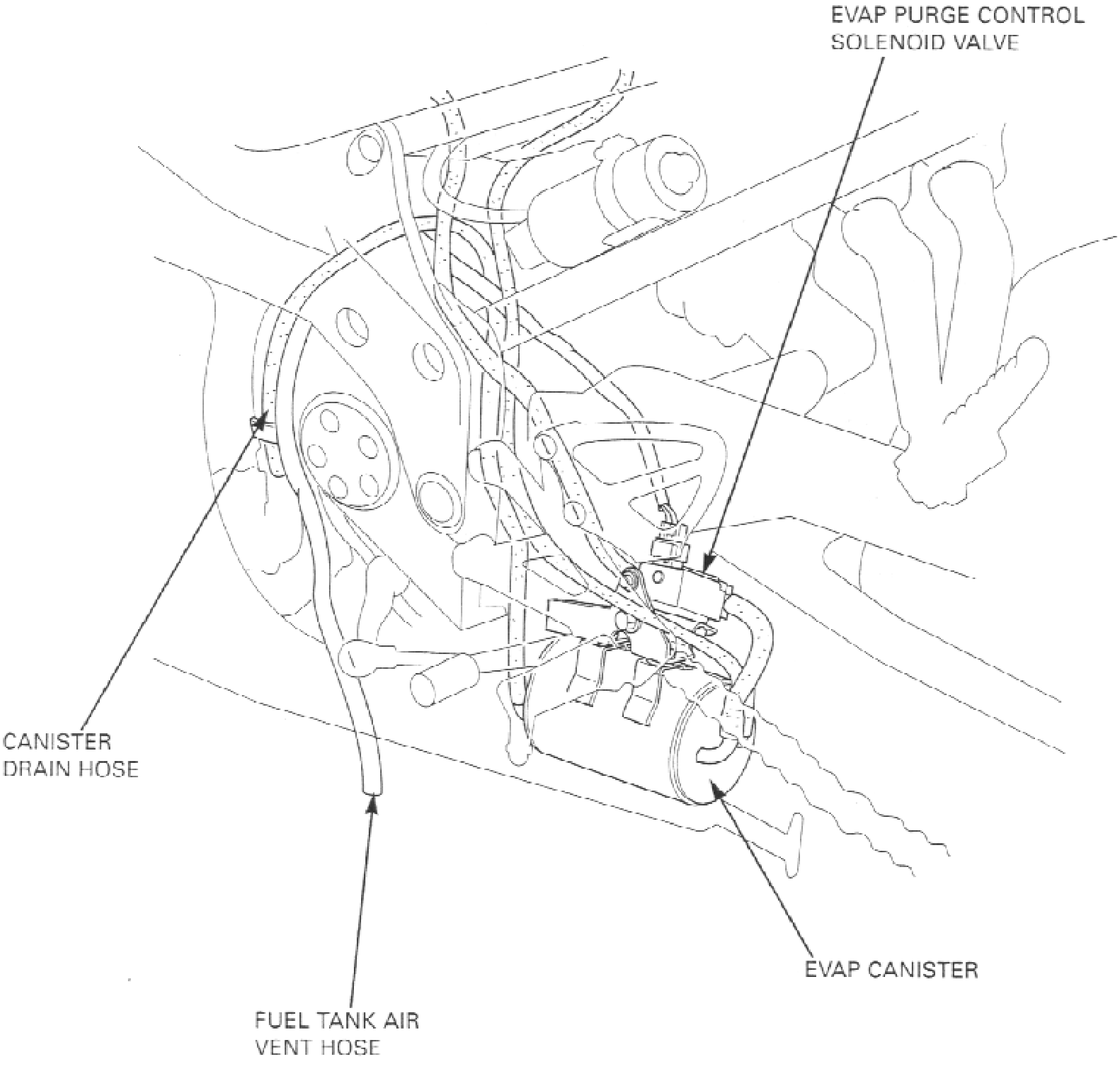

FUEL PUMP/RESERVE SENSOR WIRE
FUEL TANK OVERFLOW HOSE
FUEL TANK AIR VENT HOSE
FUEL PUMP/RESERVE SENSOR 3P (BLACK) CONNECTOR
FUEL RETURN HOSE
FUEL HOSE

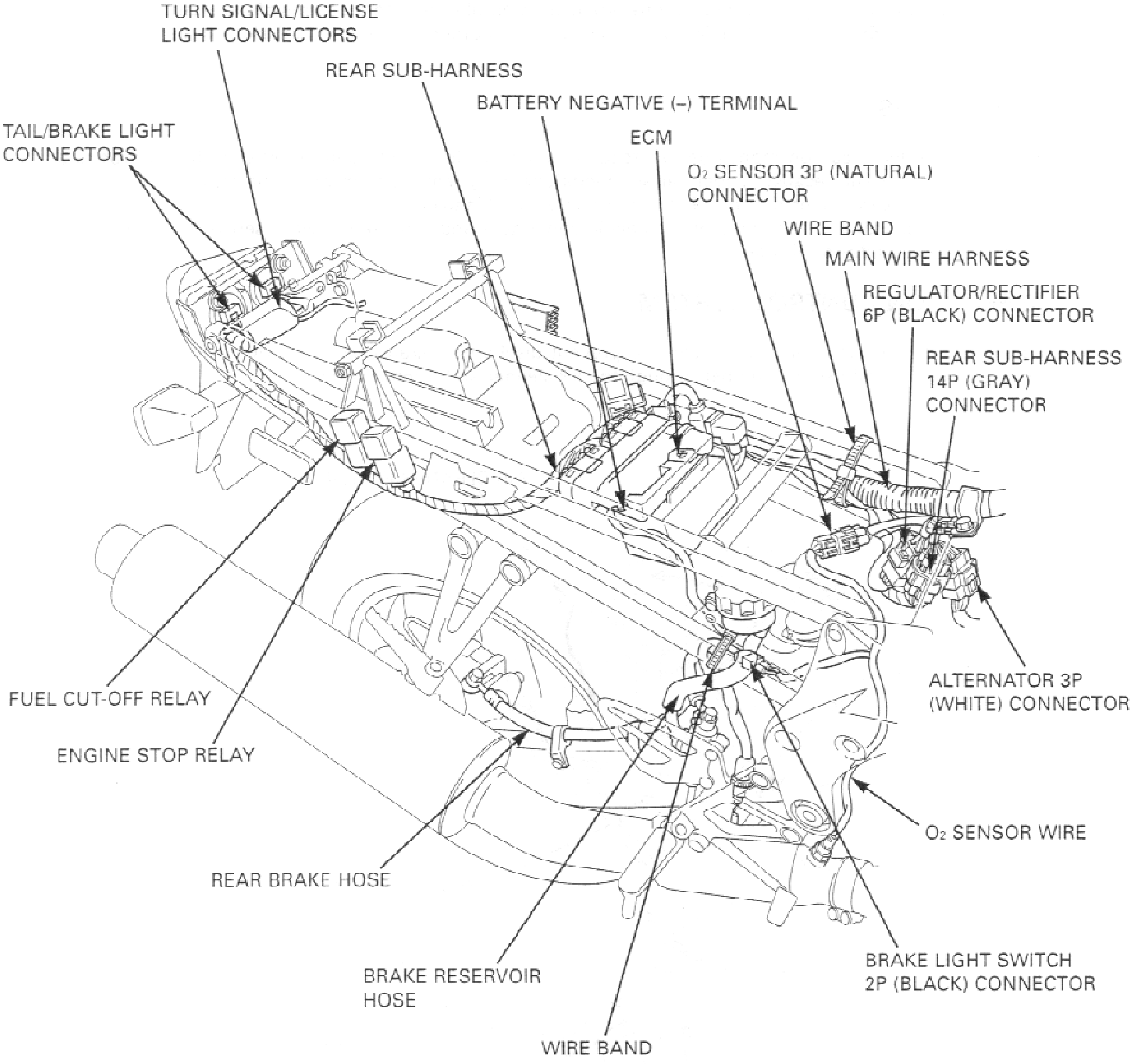

ECM 22P (BLACK) CONNECTOR
ECM 22P (LIGHT GRAY) CONNECTOR
BATTERY
MAIN WIRE HARNESS
REGULATOR/RECTIFIER
FUSE BOX
PGM-FI FUSE HOLDER
SHOCK ABSORBER RESERVOIR HOSE
SERVICE CHECK CONNECTOR
WIRE BAND
STARTER RELAY SWITCH/ MAIN FUSE


TURN SIGNAL/LICENSE
LIGHT CONNECTORS
REAR SUB-HARNESS
TAIL/BRAKE LIGHT
CONNECTORS
BATTERY NEGATIVE (–) TERMINAL
ECM
WIRE BANDS
MAIN WIRE HARNESS
REGULATOR/RECTIFIER
6P (BLACK) CONNECTOR
REAR SUB-HARNESS
14P (GRAY)
CONNECTOR
ALTERNATOR 3P
(WHITE) CONNECTOR
FUEL CUT-OFF RELAY
ENGINE STOP RELAY
REAR BRAKE HOSE
BRAKE LIGHT SWITCH
2P (BLACK) CONNECTOR
WIRE BAND
BRAKE RESERVOIR
HOSE

CALIFORNIA TYPE:




EVAP PURGE CONTROL
SOLENOID VALVE
CANISTER
DRAIN HOSE
EVAP CANISTER
FUEL TANK AIR
VENT HOSE



TURN SIGNAL/LICENSE LIGHT CONNECTORS
REAR SUB-HARNESS
BATTERY NEGATIVE (–) TERMINAL
TAIL/BRAKE LIGHT CONNECTORS
ECM
O_2 SENSOR 3P (NATURAL) CONNECTOR
WIRE BAND
MAIN WIRE HARNESS
REGULATOR/RECTIFIER 6P (BLACK) CONNECTOR
REAR SUB-HARNESS 14P (GRAY) CONNECTOR
ALTERNATOR 3P (WHITE) CONNECTOR
FUEL CUT-OFF RELAY
ENGINE STOP RELAY
O_2 SENSOR WIRE
REAR BRAKE HOSE
BRAKE LIGHT SWITCH 2P (BLACK) CONNECTOR
BRAKE RESERVOIR HOSE
WIRE BAND

EMISSION CONTROL SYSTEMS

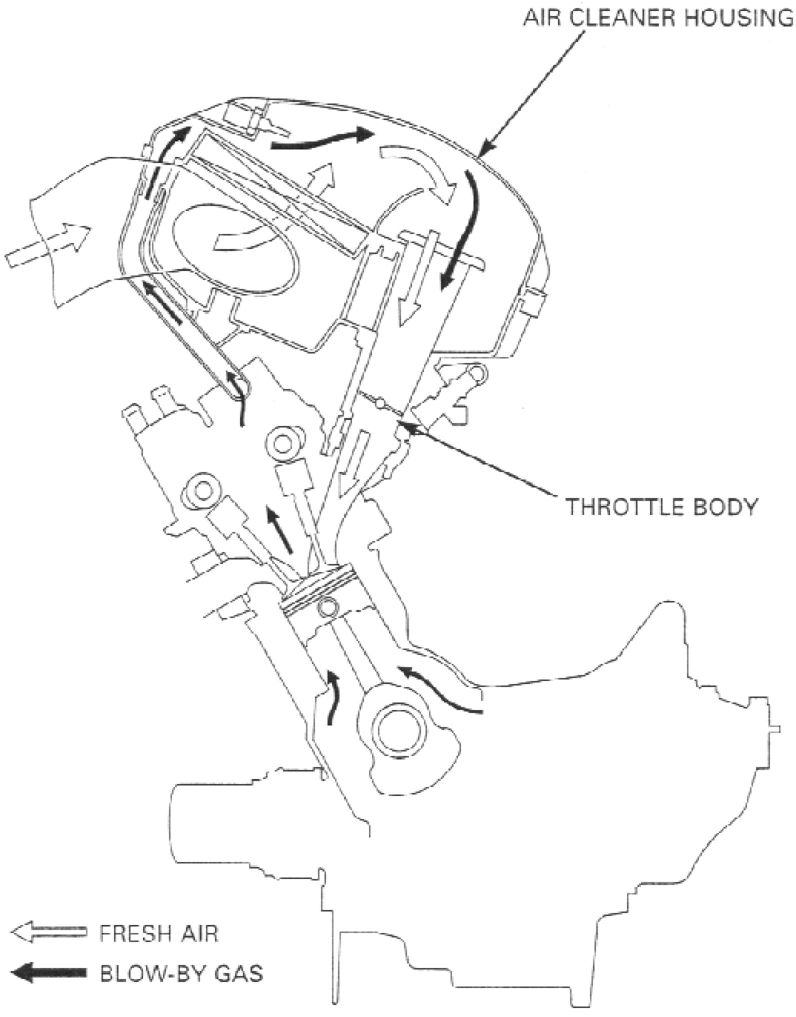
The U.S. Environmental Protection Agency, California Air Resources Board (CARB) and Transport Canada require manufacturers to certify that their motorcycles comply with applicable exhaust emissions standards during their useful life, when operated and maintained according to the instructions provided, and that motorcycles built after January 1, 1983 comply with applicable noise emission standards for one year or 3,730 miles (6,000 km) after the time of sale to the ultimate purchaser, when operated and maintained according to the instructions provided. Compliance with the terms of the Distributor's Limited Warranty for Honda Motorcycle Emission Control Systems is necessary in order to keep the emissions system warranty in effect.

SOURCE OF EMISSIONS

The combustion process produces carbon monoxide, hydrocarbons and oxides of nitrogen. Control of hydrocarbons and oxides of nitrogen is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.
Honda Motor Co., Ltd. utilizes PGM-FI, two three-way catalytic converters and a heated oxygen sensor to reduce carbon monoxide, hydrocarbons, and oxides of nitrogen.

CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow-by gas is returned to the combustion chamber through the air cleaner and throttle body.



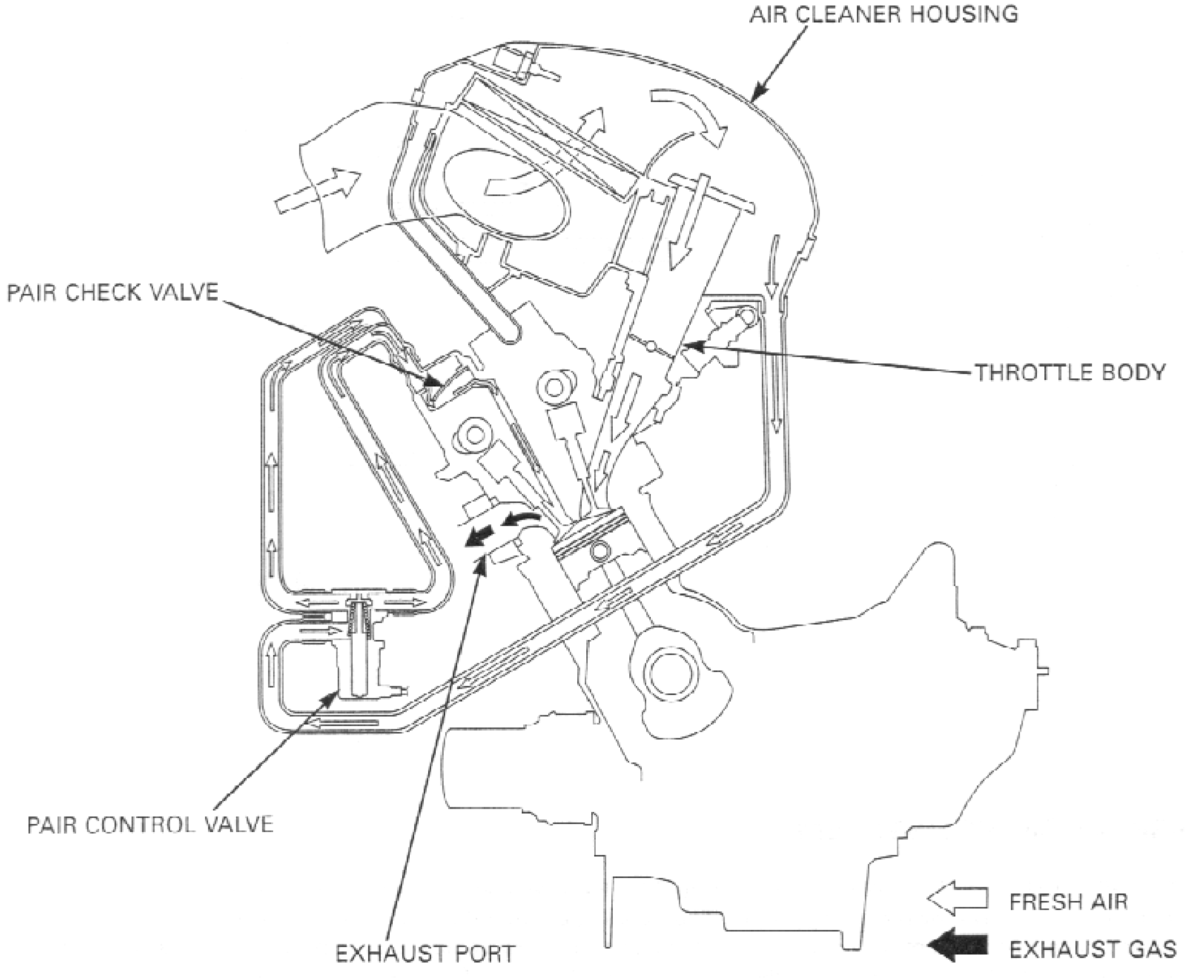
EXHAUST EMISSION CONTROL SYSTEM (PULSE SECONDARY AIR SUPPLY SYSTEM)

The exhaust emission control system is composed of a lean fuel injection setting, and no adjustments should be made except idle speed adjustment with the throttle stop screw. The exhaust emission control system is separate from the crankcase emission control system.

The exhaust emission control system consists of a secondary air supply system which introduces filtered air into the exhaust gases in the exhaust port. Fresh air is drawn into the exhaust port by the function of the Pulse Secondary Air Injection (PAIR) control valve.
This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapor.

The reed valve prevents reverse air flow through the system. The PAIR solenoid control valve is controlled by the PGM-FI unit, and the fresh air passage is opened and closed according the running condition (ECT/IAT/TP/MAP sensor and engine revolution).

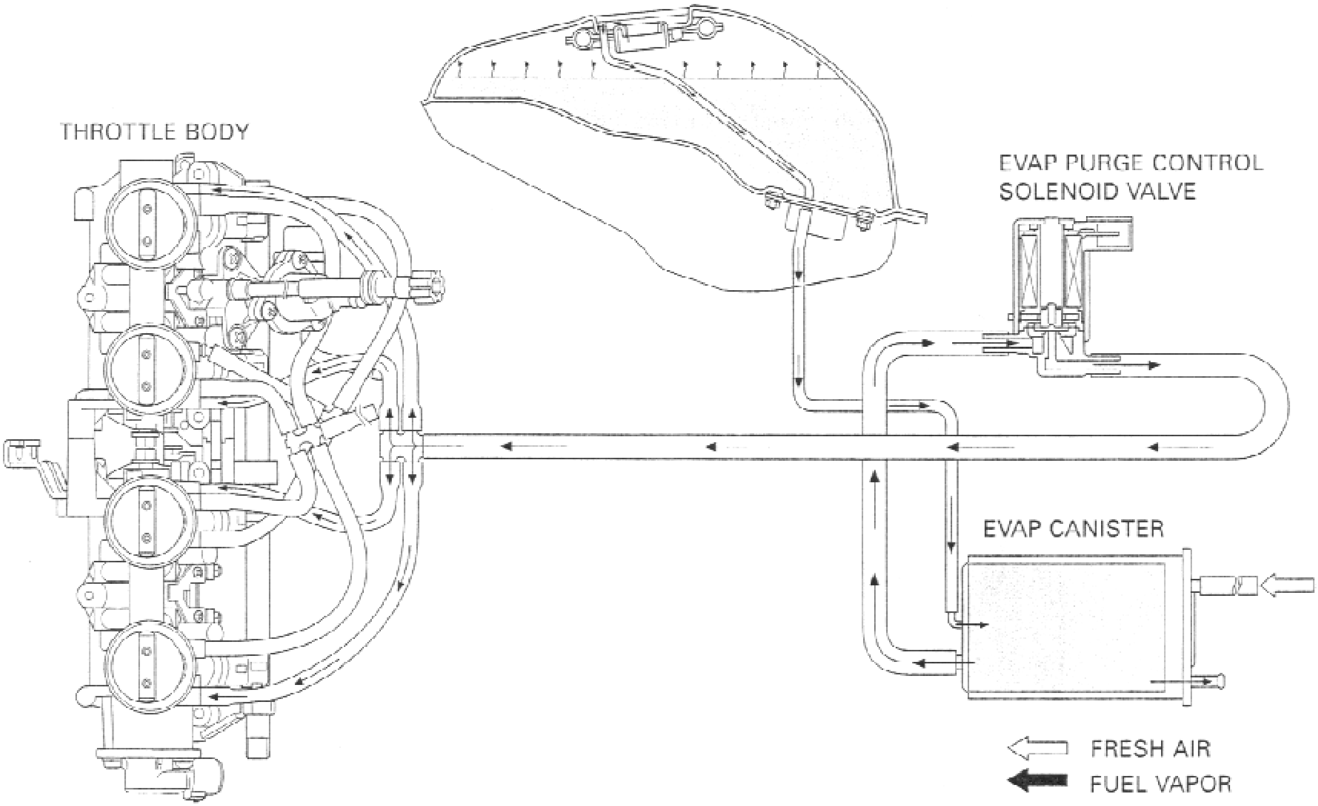
No adjustments to the secondary air supply system should be made, although periodic inspection of the components is recommended.



California type:
The California type is equipped with two three-way warm-up catalytic converters, a three-way catalytic converter, and a heated oxygen sensor.
The three-way catalytic converters are in the exhaust system. Through chemical reactions, they convert HC, CO, and NOx in the engine's exhaust to carbon dioxide (CO_2), dinitrogen (N_2), and water vapor.
No adjustment to these systems should be made although periodic inspection of the components is recommended.

EVAPORATIVE EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY)

This model complies with California Air Resources Board evaporative emission requirements.
Fuel vapor from the fuel tank is routed into the evaporative emission (EVAP) canister where it is absorbed and stored while the engine is stopped. When the engine is running and the evaporative emission (EVAP) purge control solenoid valve is open, fuel vapor in the EVAP canister is drawn into the engine through the throttle body.



NOISE EMISSION CONTROL SYSTEM

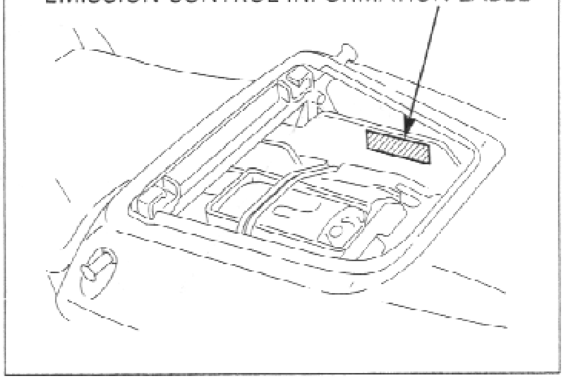
TAMPERING WITH THE NOISE CONTROL SYSTEM IS PROHIBITED: Federal, state and local law prohibits the following acts or the causing thereof: (1) The removal or rendering inoperative by any person, other than for purposes of maintenance, repair or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use; (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:

1. Removal of, or puncturing of the muffler, baffles, header pipes or any other component which conducts exhaust gases.
2. Removal of, or puncturing of any part of the intake system.
3. Lack of proper maintenance.
4. Replacing any moving parts of the vehicle, or parts of the exhaust or intake system, with parts other then those specified by the manufacturer.

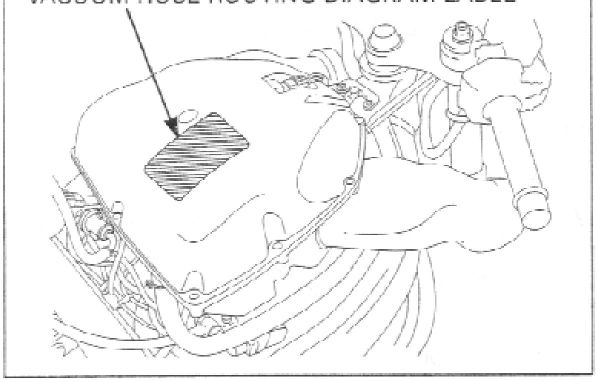
EMISSION CONTROL INFORMATION LABELS (U.S.A. ONLY)

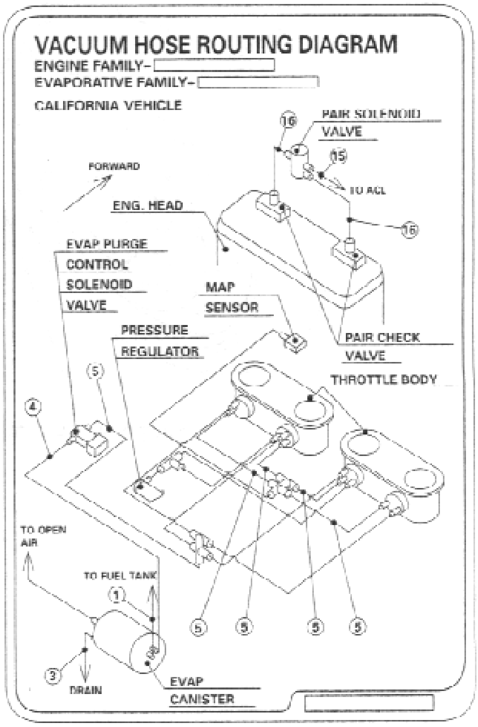
An Emission Control Information Label is located on the storage compartment as shown.
The pillion seat must be removed to read it.
It gives base tune-up specifications.



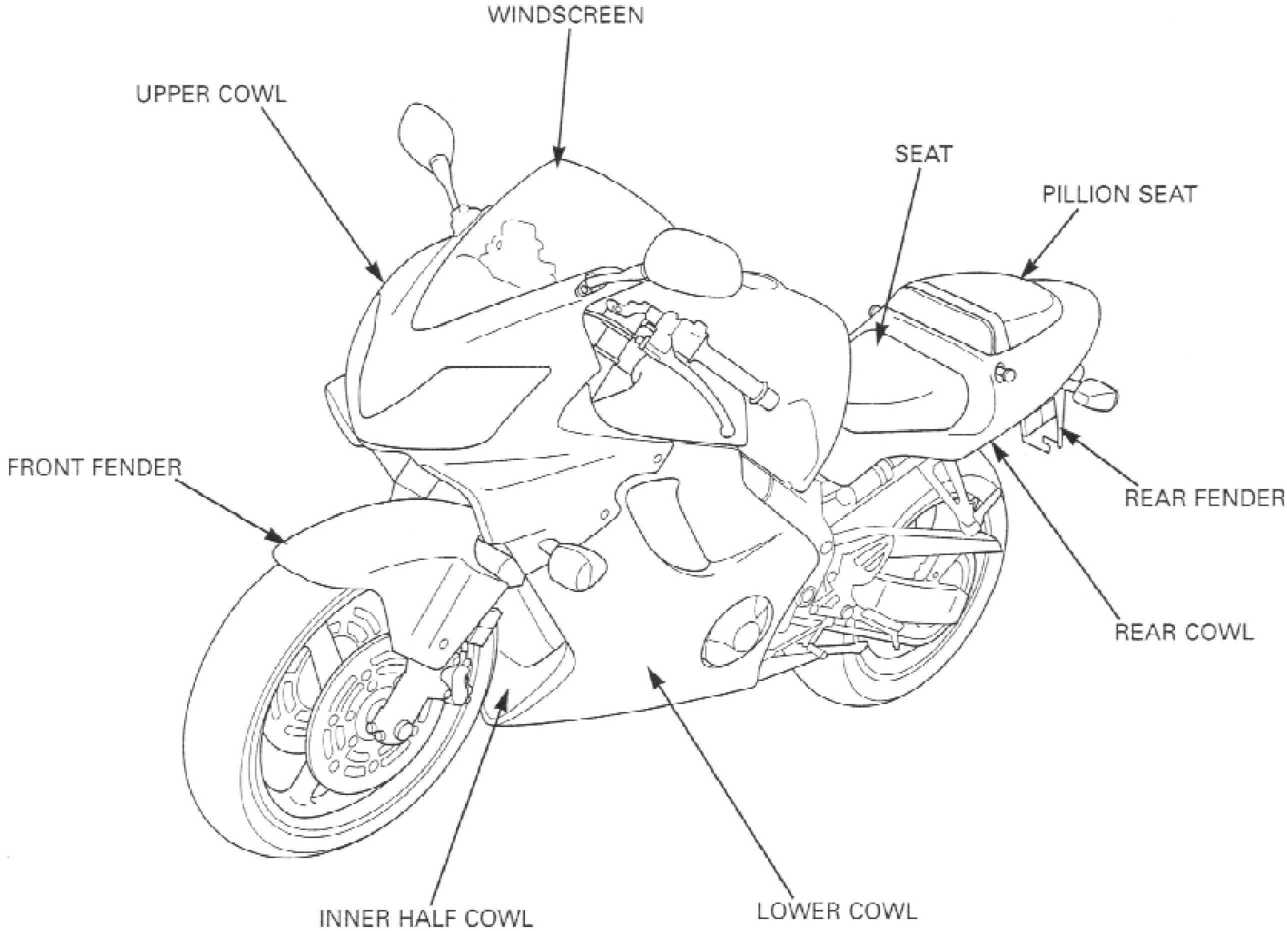
VACUUM HOSE ROUTING DIAGRAM LABEL (CALIFORNIA TYPE ONLY)

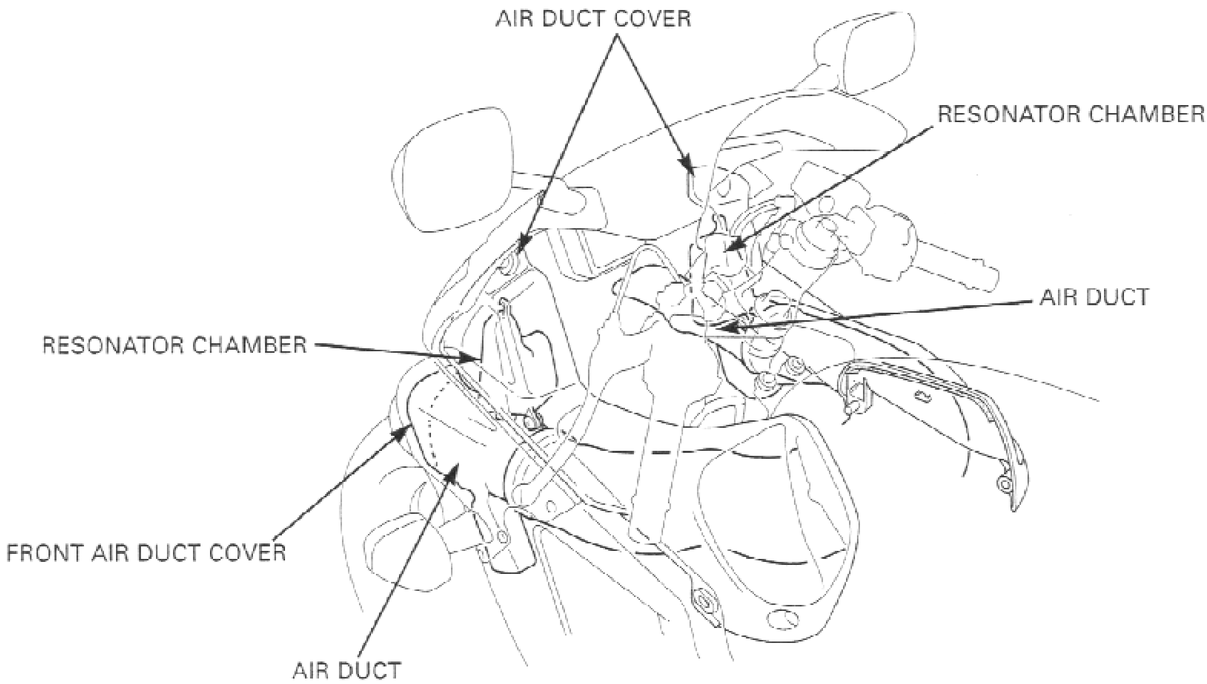
The Vacuum Hose Routing Diagram Label is on the air cleaner housing cover as shown.
The fuel tank must be opened to read it. Refer to page 3-4 for fuel tank opening.





BODY PANEL LOCATIONS





2. FRAME/BODY PANELS/EXHAUST SYSTEM

SERVICE INFORMATION

GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the body panels and exhaust system.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.
- Always replace the exhaust pipe gaskets after removing the exhaust pipe from the engine.
- When installing the exhaust system, loosely install all of the exhaust pipe fasteners. Always tighten the exhaust clamps first, then tighten the mounting fasteners. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Upper cowl-to-lower cowl screw	2 N•m (0.15 kgf•m, 1.1 lbf•ft)
Inner half cowl-to-lower cowl screw	2 N•m (0.15 kgf•m, 1.1 lbf•ft)
Windscreen setting screw	1 N•m (0.05 kgf•m, 0.4 lbf•ft)
Seat rail upper mounting bolt/nut	49 N•m (5.0 kgf•m, 36 lbf•ft)
Seat rail lower mounting bolt/nut	49 N•m (5.0 kgf•m, 36 lbf•ft)
Exhaust pipe joint flange nut	12 N•m (1.2 kgf•m, 9 lbf•ft)
Muffler band flange bolt	23 N•m (2.3 kgf•m, 17 lbf•ft)
Passenger footpeg flange bolt	26 N•m (2.7 kgf•m, 20 lbf•ft)

TROUBLESHOOTING

Excessive exhaust noise
- Broken exhaust system
- Exhaust gas leak

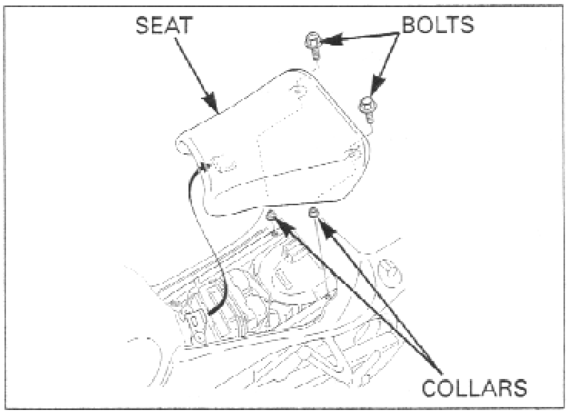
Poor performance
- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

SEAT

REMOVAL

Remove the two seat mounting bolts behind the seat.

Side the seat back and then remove it.
Remove the mounting collars.

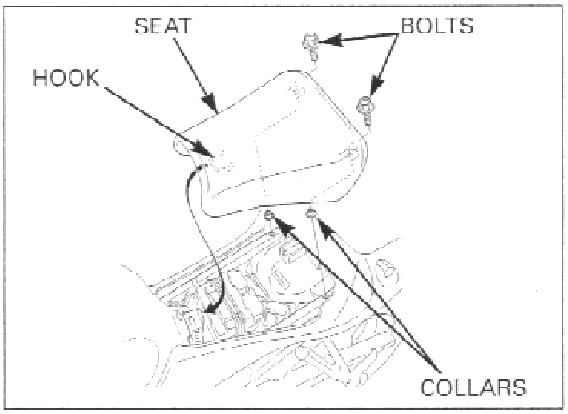


INSTALLATION

Be careful not to drop the mounting collars.

Install the mounting collars into the seat brackets as shown.
Align the seat hook with the fuel tank rear bracket and install the seat.

Install and tighten the seat mounting bolts securely.

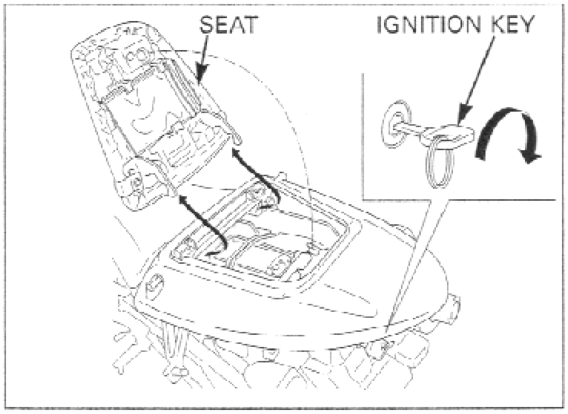


PILLION SEAT/REAR COWL

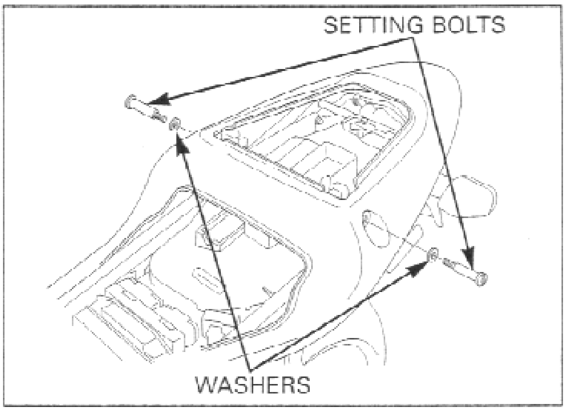
REMOVAL

Remove the seat (see above).

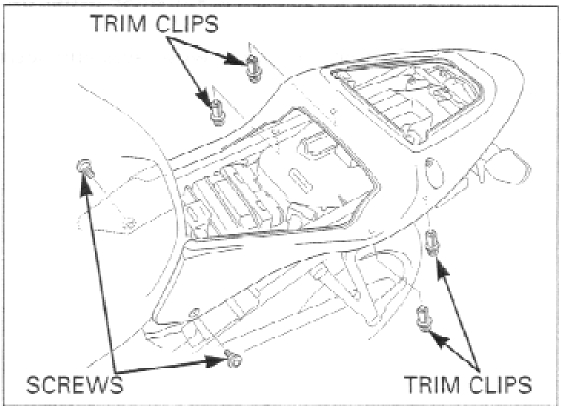
Unhook the pillion seat lock using the ignition key.
Pull up the rear end of the pillion seat and then remove the seat.



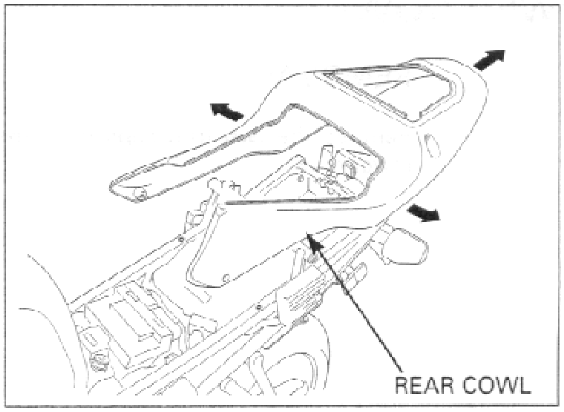
Remove the rear cowl setting bolts and washers.



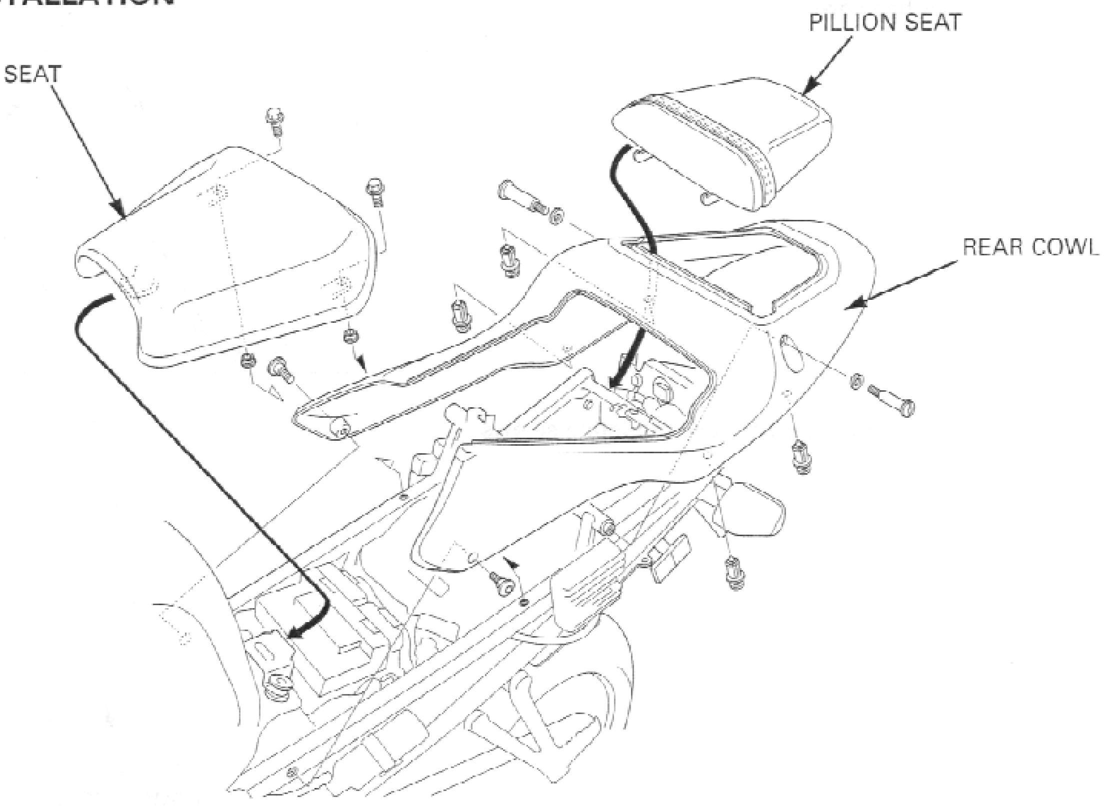
Remove the two 5 mm screws and four trim clips.



Carefully pull both sides of the rear cowl, then remove it from the seat rail.



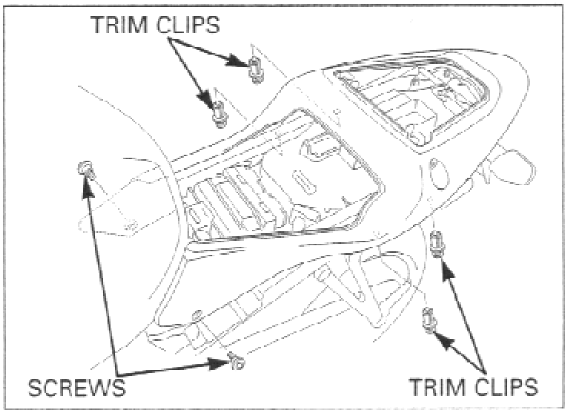
INSTALLATION



Installation is in the reverse order of removal.

Make sure the mating surfaces of the cowl bottom are seated onto the rear fender properly before tightening the fasteners.

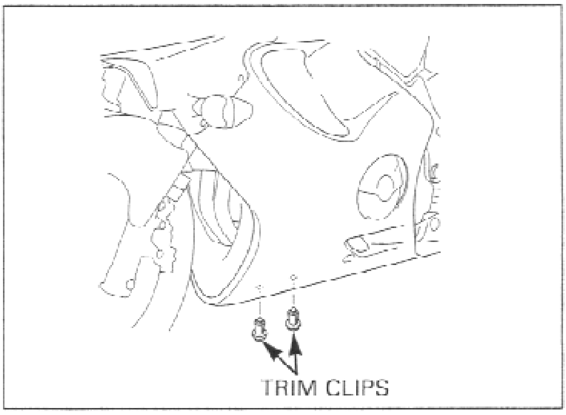
Tighten the rear cowl screws and setting bolt securely.



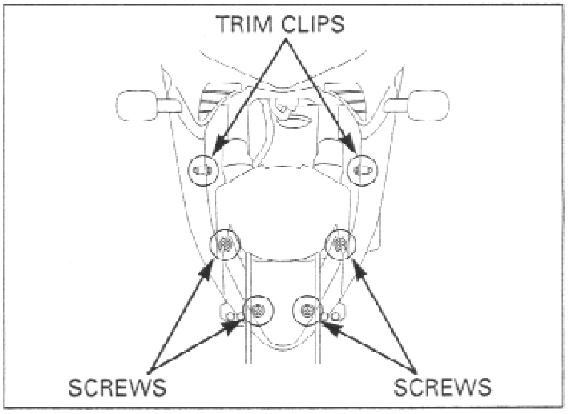
LOWER COWL

REMOVAL

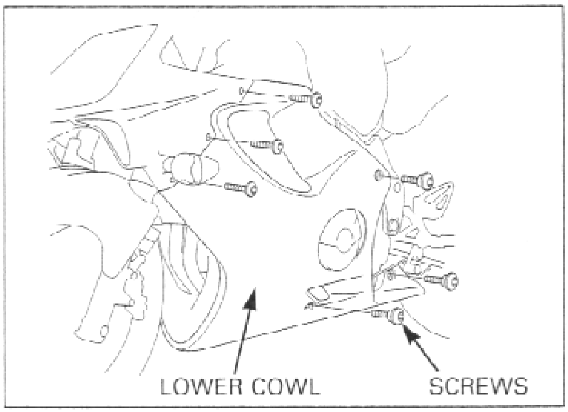
Remove the two trim clips from the bottom of the lower cowl.



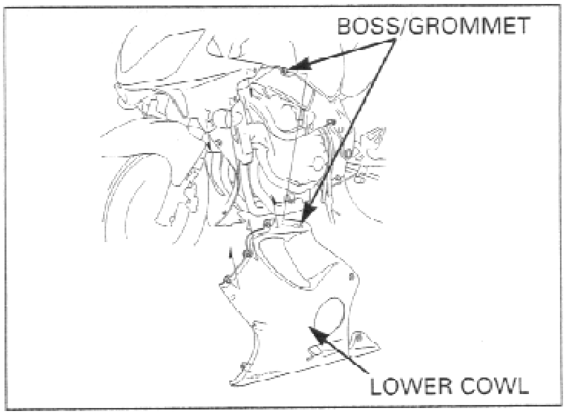
Remove the two trim clips and four screws from the inner half cowl.



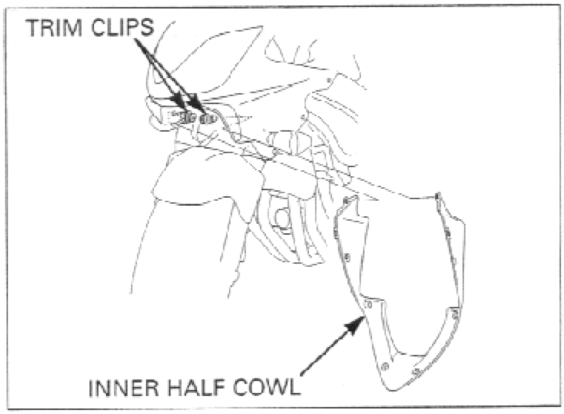
Remove the six lower cowl mounting screws.



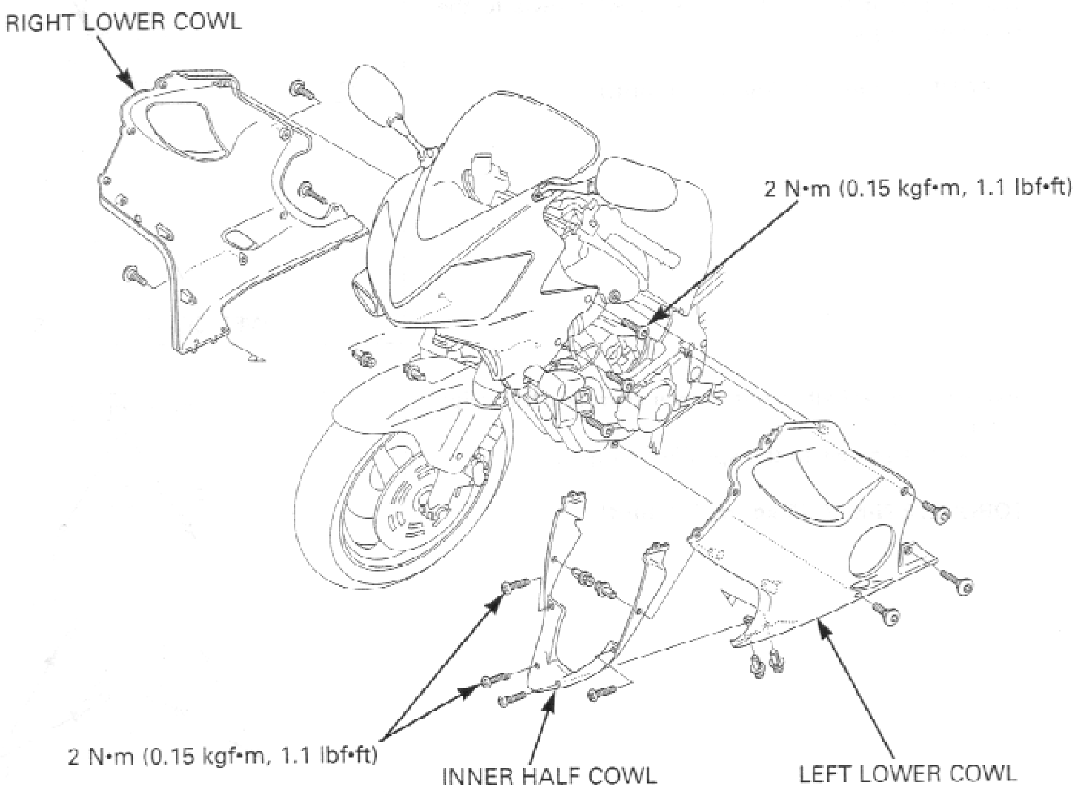
Release the lower cowl boss from the air intake duct cover grommet, then remove the lower cowl.



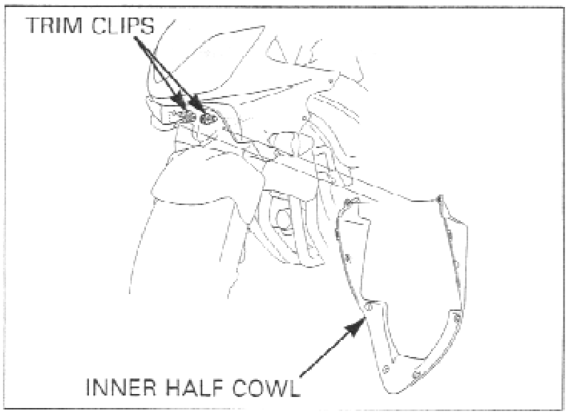
Remove the two trim clips and inner half cowl.



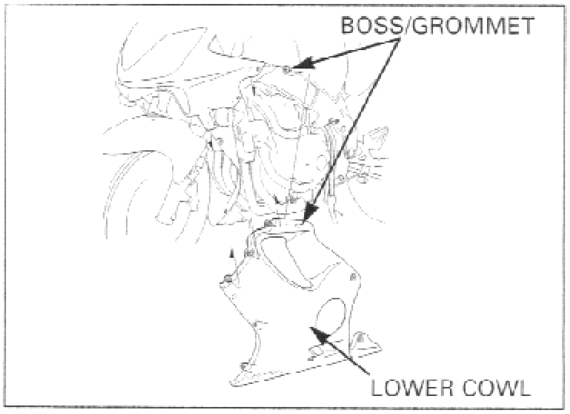
INSTALLATION



Install the inner half cowl into the upper cowl and secure it with two trim clips.



Set the lower cowl onto the frame and install the lower cowl boss into the air duct cover grommet.

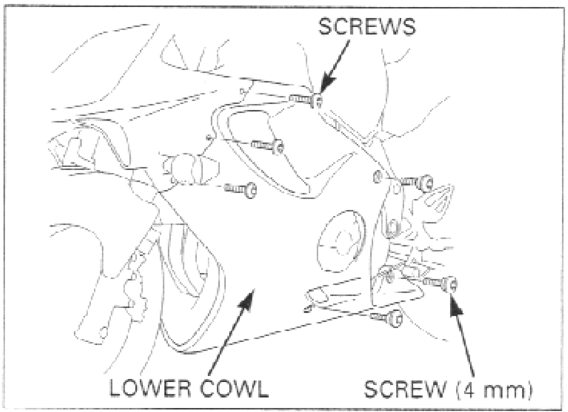


Install the 4-mm screw into the correct location as shown in the illustration.

Install the six screws.

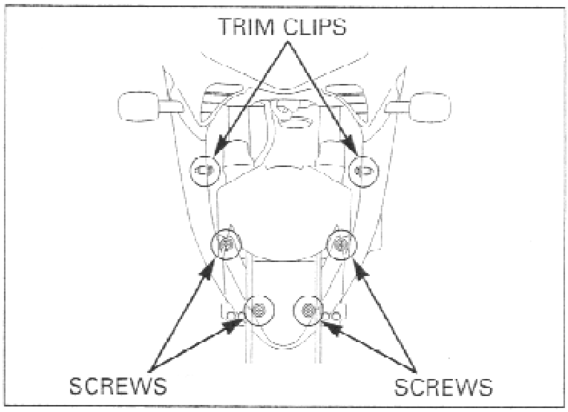
Tighten the upper cowl-to-lower cowl screws to the specified torque.

TORQUE: 2 N·m (0.15 kgf·m, 1.1 lbf·ft)

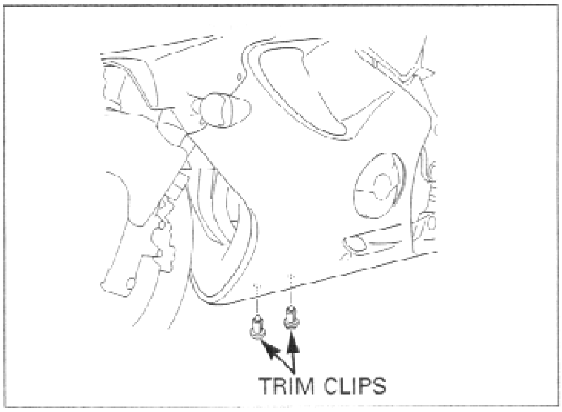


Install the inner half cowl-to-lower cowl two trim clips and four screws.
Tighten the screws to the specified torque.

TORQUE: 2 N·m (0.15 kgf·m, 1.1 lbf·ft)



Install the two trim clips into the bottom of the lower cowl.

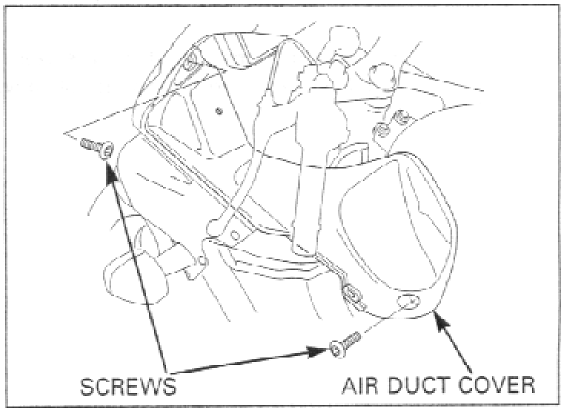


UPPER COWL

REMOVAL

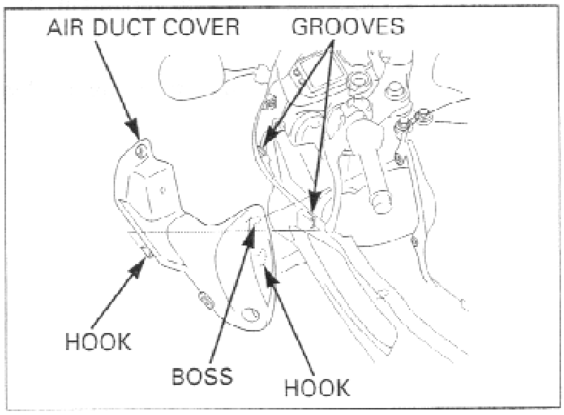
Remove the lower cowl and inner half cowl (page 2-4).

Remove the air duct cover mounting two screws.

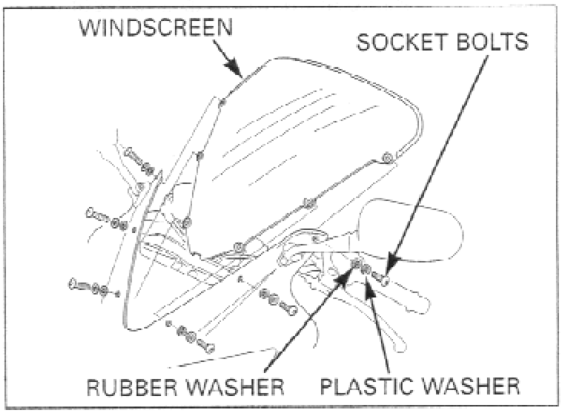


Be careful not to damage the tabs.

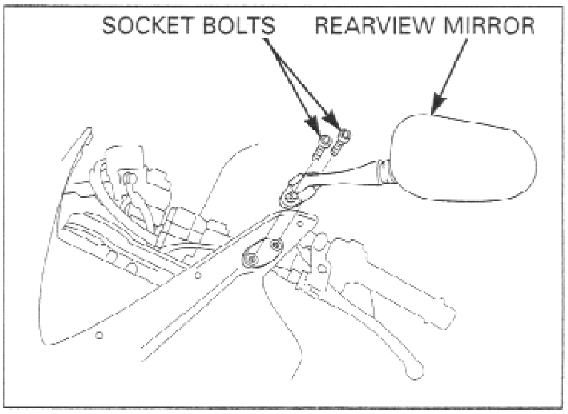
Carefully release the air intake duct cover boss and hook from the fuel tank.
Remove the air duct cover while releasing the hook from the upper cowl groove.



Remove the socket bolts, plastic and rubber washers, then remove the windscreen.



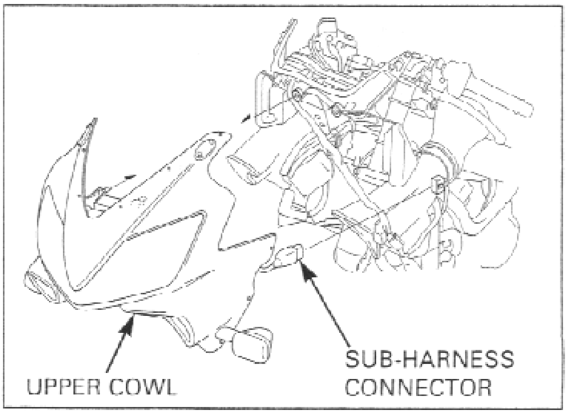
Remove the rearview mirror mounting socket bolts and rearview mirror.



Be careful not to scratch the upper cowl and front fender.

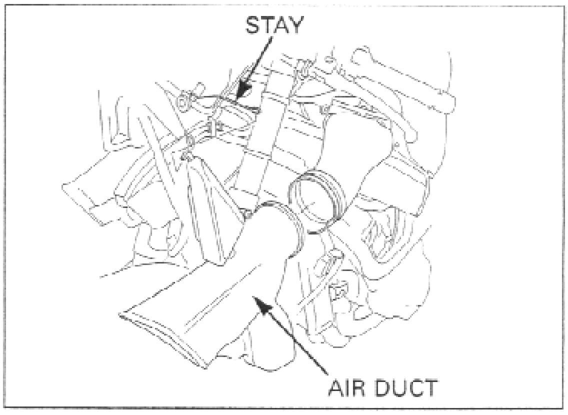
Disconnect the front sub-harness connector.

Release the upper cowl off the rearview mirror bolt hole studs and remove the upper cowl assembly.

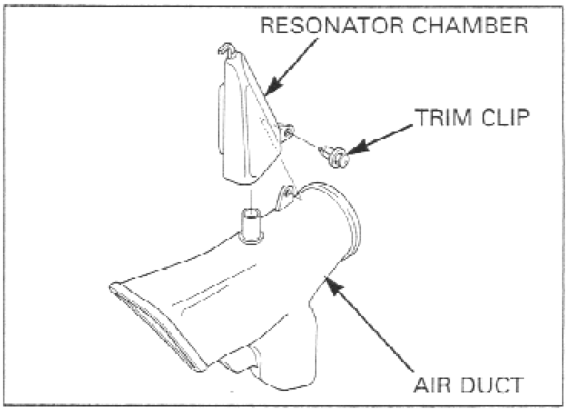


Unhook the resonator chamber stays from the resonators.

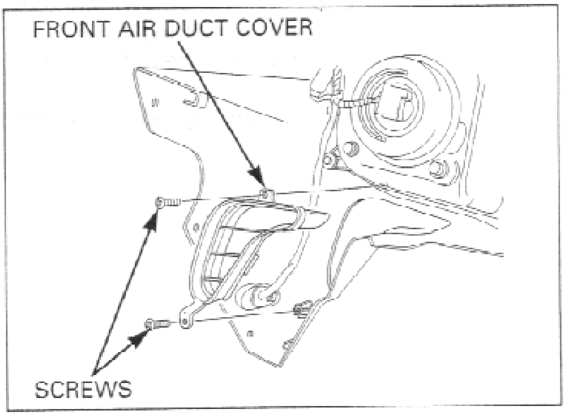
Remove the air duct from the air cleaner intake duct.



Remove the trim clip and resonator from the air duct.



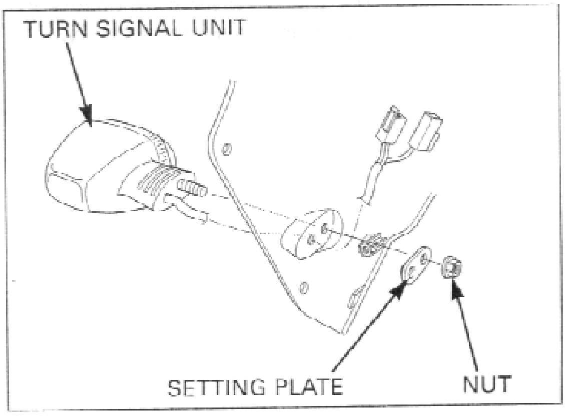
Remove the front air duct covers from the upper cowl.



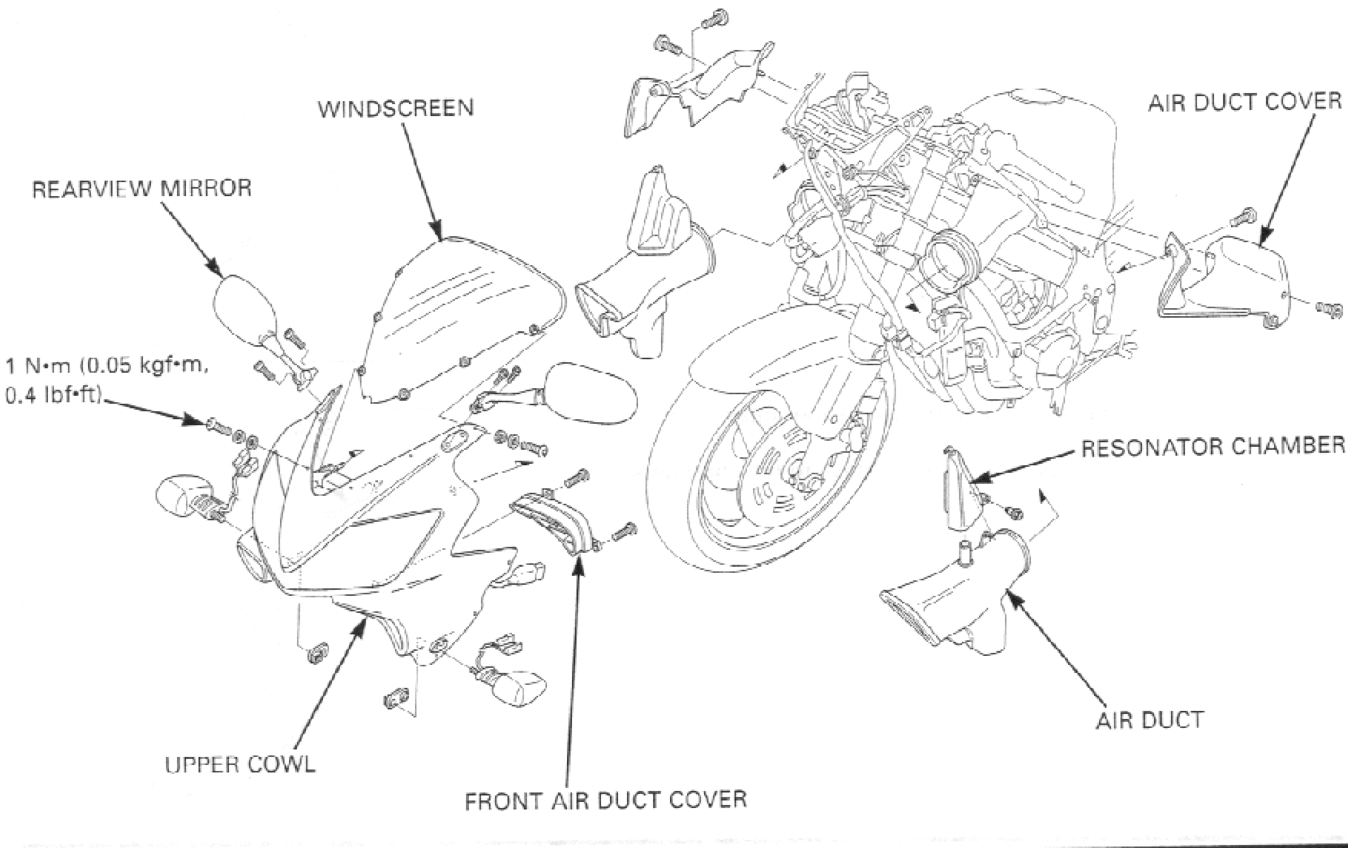
Disconnect the turn signal/running light connectors.

Remove the nut and setting plate, then remove the front turn signal unit.

Refer to section 19 for front sub-harness, headlight/turn signal relay and headlight unit removal/installation.
Refer to section 5 for engine stop sensor and relay removal/installation.

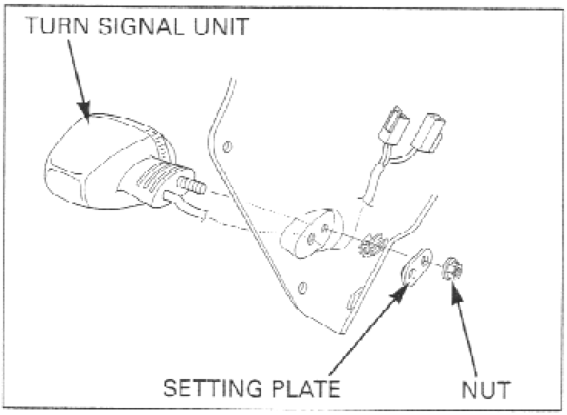


INSTALLATION

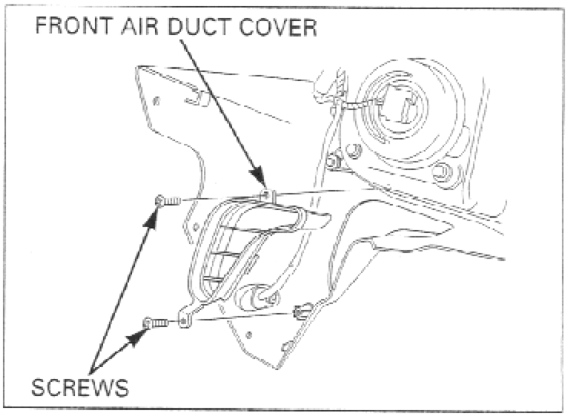


Route the turn signal wire into the upper cowl, inner middle cowl and setting plate.
Install and tighten the nut securely.

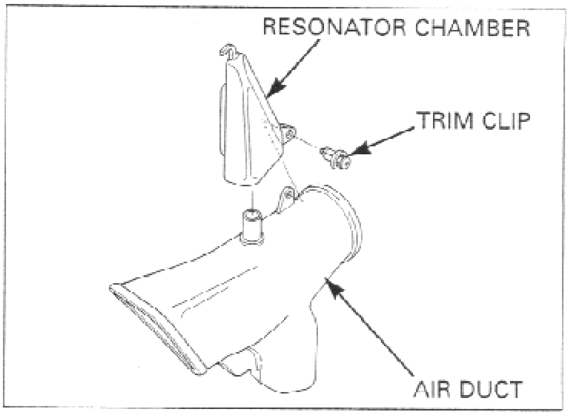
Connect the turn signal/running light connectors.



Install the front air duct covers into the upper cowl and tighten the screw securely.

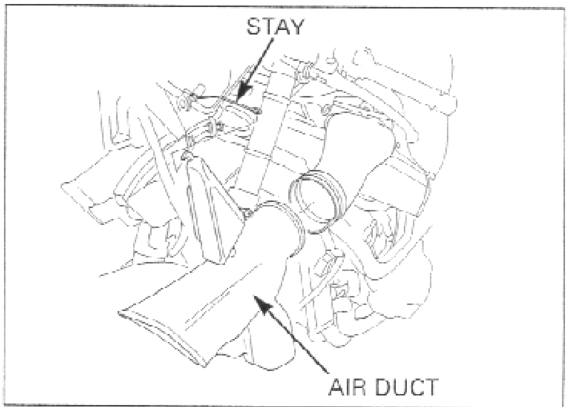


Install the resonator onto the air duct and secure it with a trim clip.

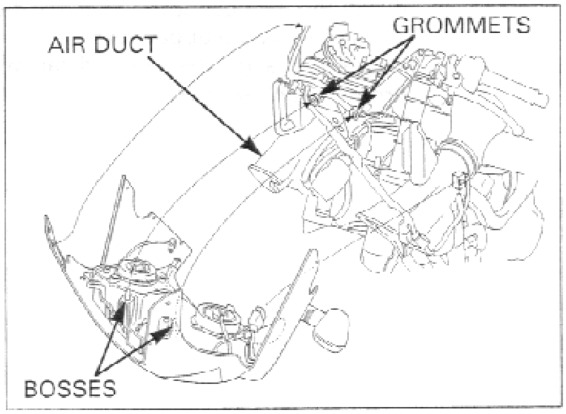


Install the air duct into the air cleaner intake duct.

Hook the resonator chamber stays to the chambers.



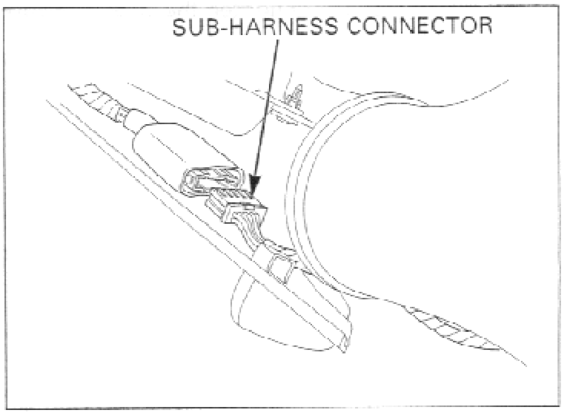
Install the upper cowl onto the upper cowl stay while aligning the headlight unit bosses with the upper cowl stay grommets.
Be sure to align the air duct covers with the air ducts.



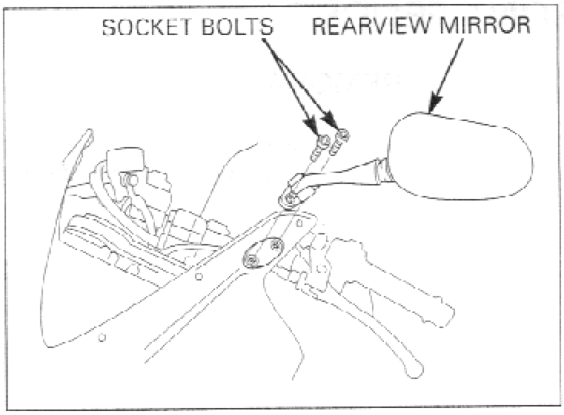
Set the upper cowl onto the rearview mirror bolt hole studs.

Route the harness and wires properly (page 1-23).

Connect the front sub-harness connector.



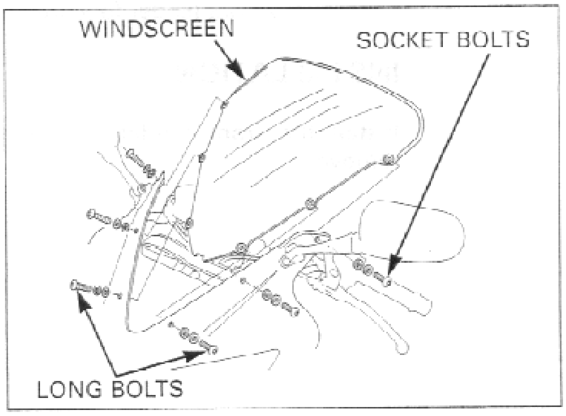
Install the rearview mirror and tighten the socket bolts securely.



Install the longer socket bolts into the lower ends of the windscreen.

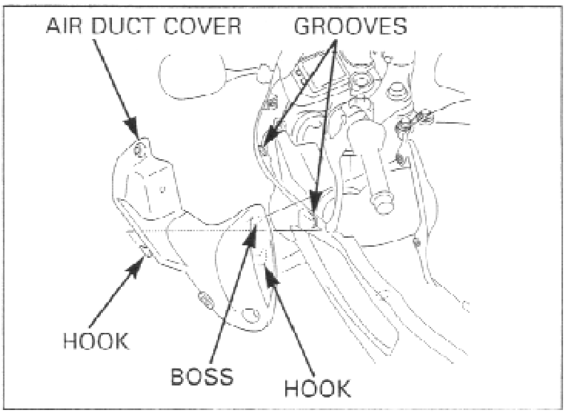
Install the windscreen, then install the rubber and plastic washers and socket bolts.
First tighten the lower four socket bolts, then tighten the upper two socket bolts to the specified torque.

TORQUE: 1 N·m (0.05 kgf·m, 0.4 lbf·ft)

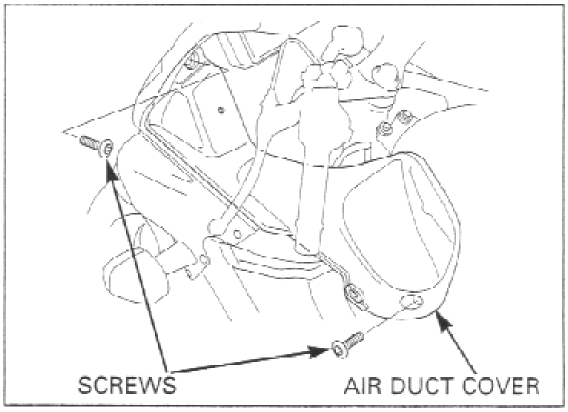


Be careful not to damage the tabs.

Install the air duct cover aligning the duct boss with the groove in the upper cowl
Be sure to align the pin and tab with the fuel tank grommet and groove.



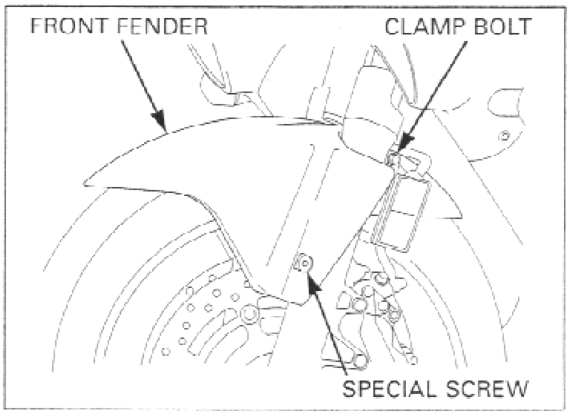
Install and tighten the screws securely.



FRONT FENDER

REMOVAL

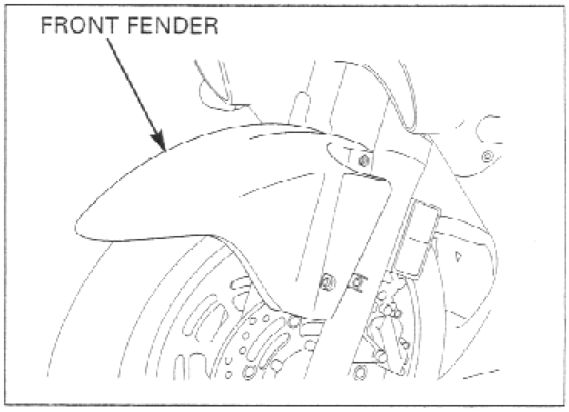
Remove the front fender mounting special screws, brake hose clamp bolts and reflectors.



Remove the front fender forward.

INSTALLATION

Install the front fender in the reverse order of removal.

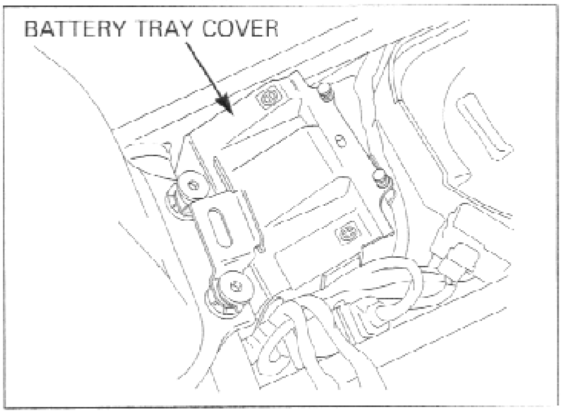


REAR FENDER

REMOVAL

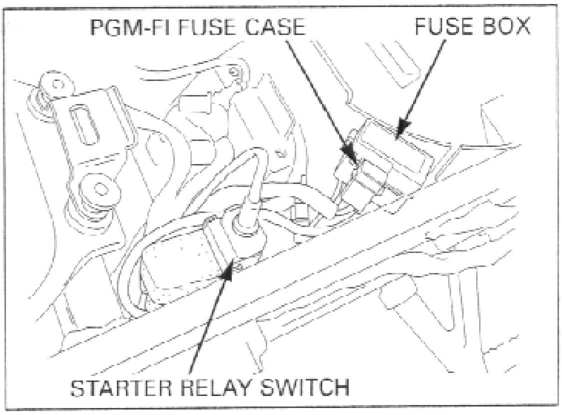
Remove the following:
- Rear cowl (page 2-2)
- ECM (page 5-85)
- Battery (page 16-5)

Release the bosses from the rear fender, then remove the battery tray cover.



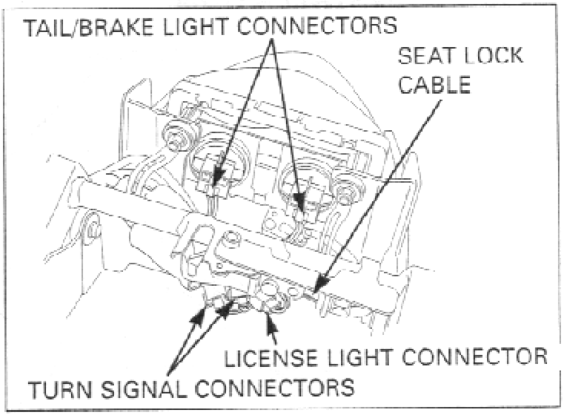
Unhook the retaining tab and remove the PGM-FI fuse case and fuse box.

Remove the starter relay switch from the rear fender boss.

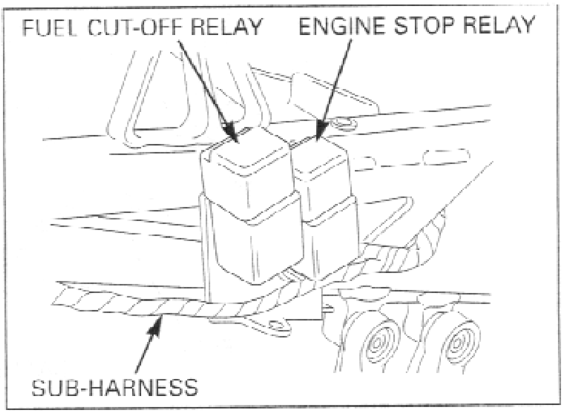


Disconnect the following connectors:
- Rear turn signal connectors
- License light connector
- Tail/brake light connectors

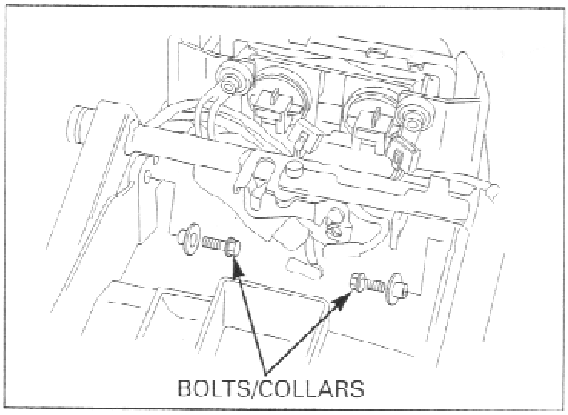
Unhook the seat lock cable from the cable stay.



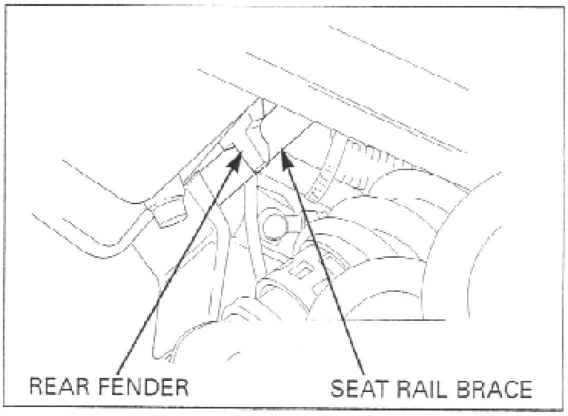
Remove the fuel cut-off relay and engine stop relay from the rear fender bosses.
Release the rear sub-harness from the rear fender wire guides.



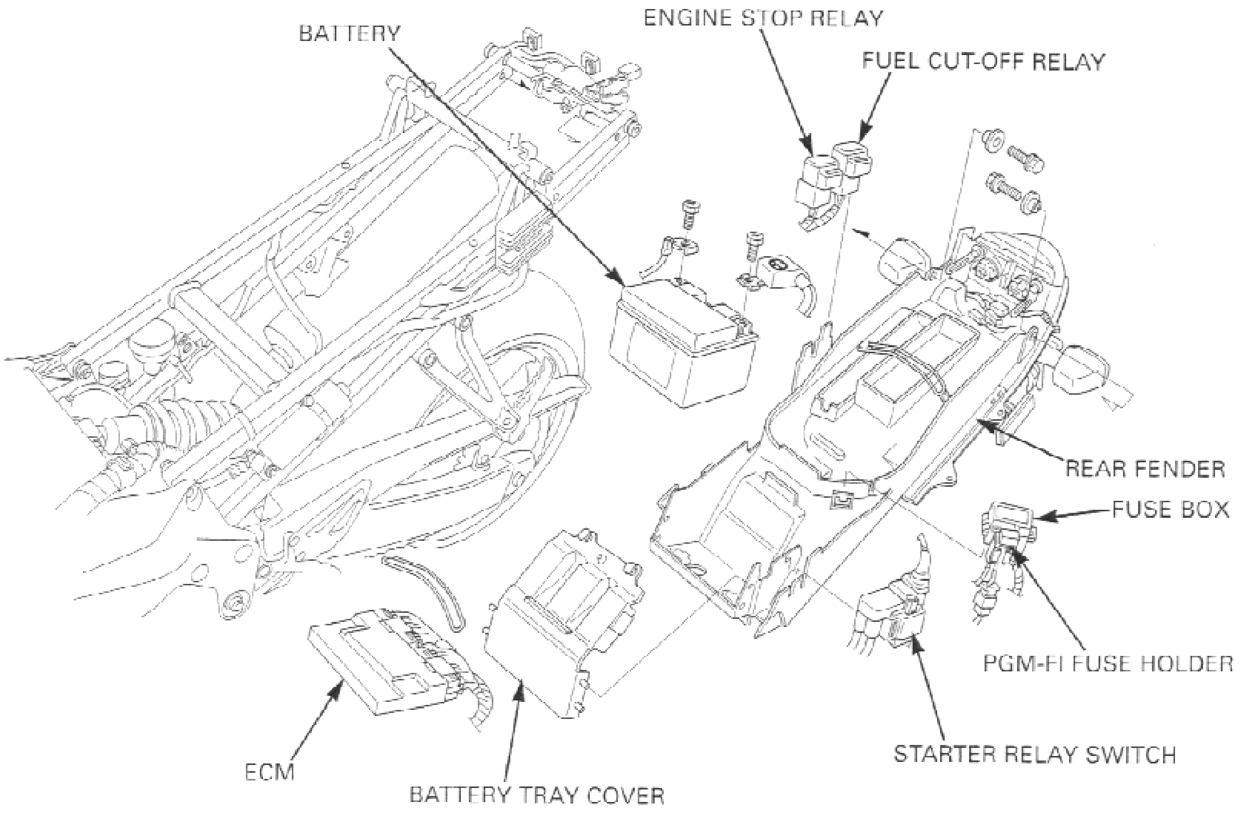
Remove the two rear fender mounting bolts and collars.



Unhook the rear fender from the seat rail brace, then remove the rear fender while moving it back.

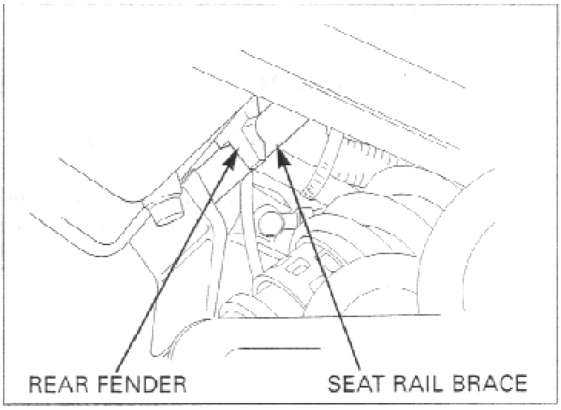


INSTALLATION

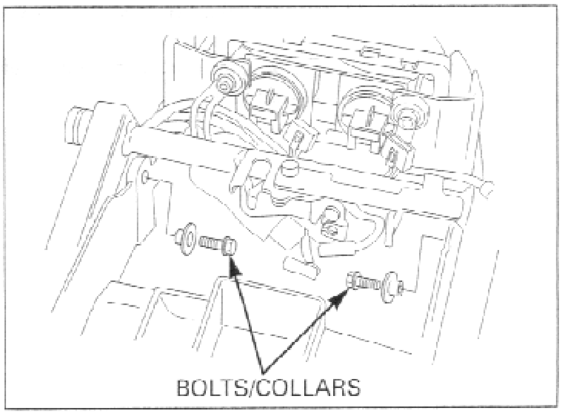


While installing the rear fender, route the wire harness properly *(page 1-23).*

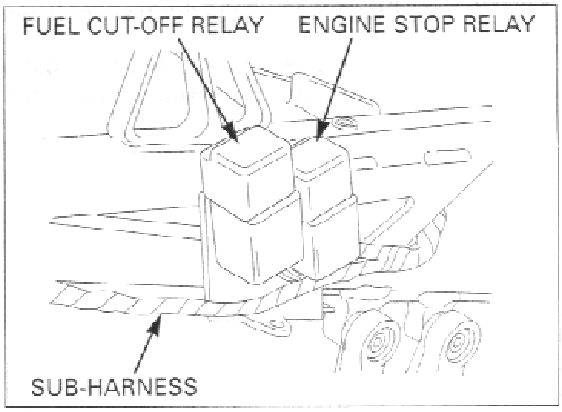
Install the rear fender while aligning its lower groove with the seat rail brace.



Install the rear fender mounting collars and bolts, and tighten the bolts securely.



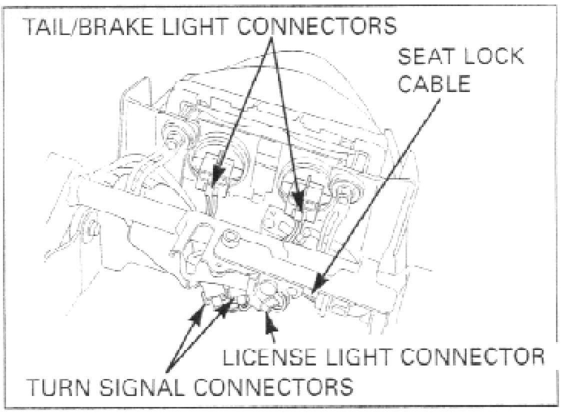
Route the rear sub-harness properly and install it into the rear fender wire guides.
Install the fuel cut-off relay and turn signal relay onto the rear fender bosses.



Connect the following connectors:
- Rear turn signal connectors
- License light connector
- Tail/brake light connectors

Connect the seat lock cable to the cable stay.

Install the removed parts in the reverse order of removal.

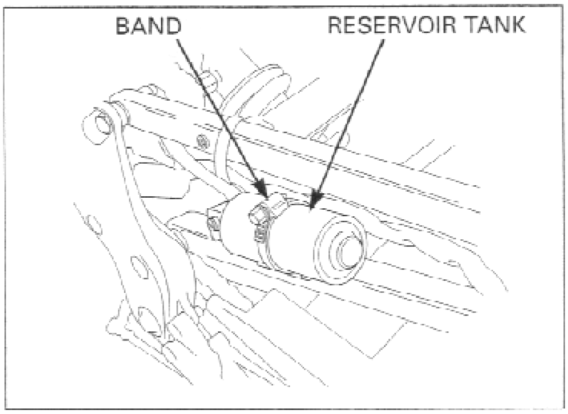


SEAT RAIL

REMOVAL

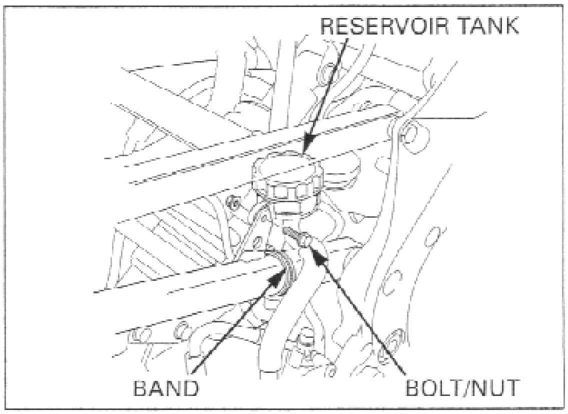
Remove the rear fender (page 2-13).

Loosen the rear shock absorber reservoir tank band and remove the reservoir tank from the seat rail.



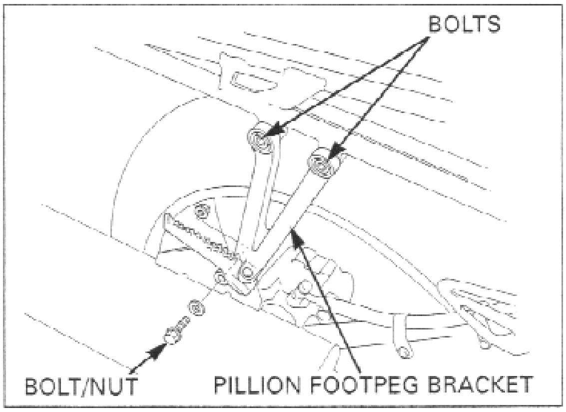
Remove the brake light switch wire band.

Remove the bolt/nut and rear brake reservoir tank from the seat rail.

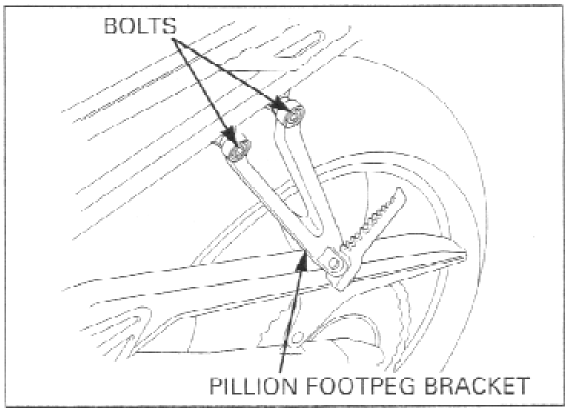


Remove the regulator/rectifier (page 16-8).

Remove the muffler mounting bolt/nut.
Remove the bolts and right pillion footpeg bracket.

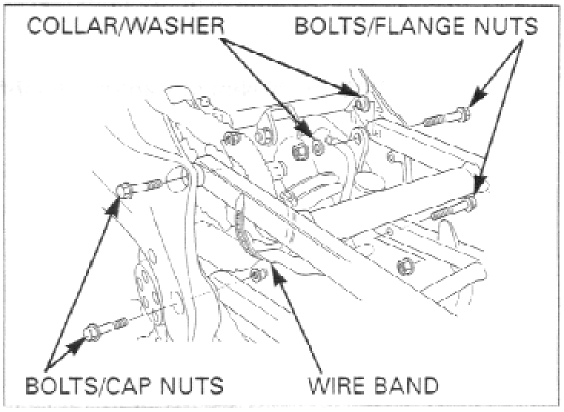


Remove the bolts and left pillion footpeg bracket.

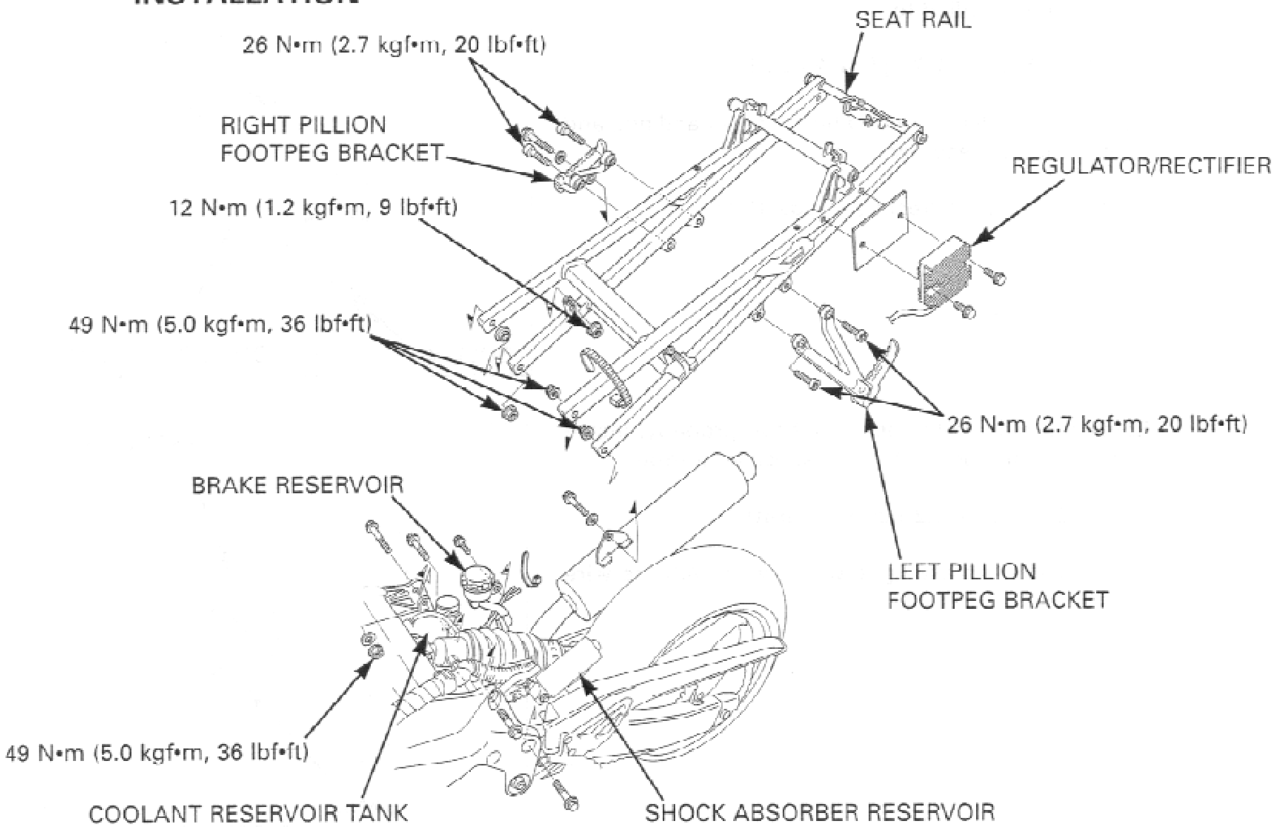


Remove the main wire harness band.

Remove the seat rail mounting bolts/nuts, coolant reservoir tank mounting collar/washer and seat rail.



INSTALLATION



Install the seat rail onto the frame.

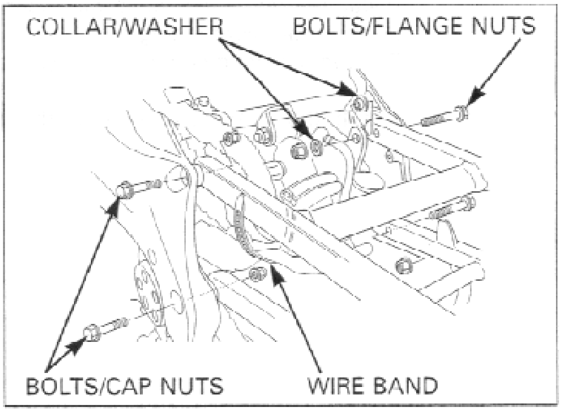
Install the cap nuts onto the left seat rail mount.

Set the coolant reservoir tank, collar and washer to the right upper mount, then install the mounting bolts and nuts.

Hold the mounting bolts and tighten the nuts to the specified torque.

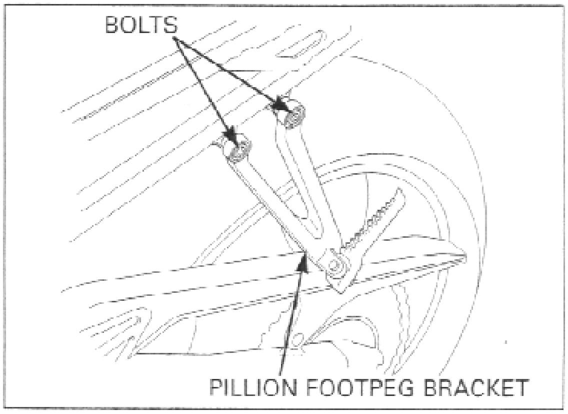
TORQUE: 49 N•m (5.0 kgf•m, 36 lbf•ft)

Secure the main wire harness with the wire band.



Install the left pillion footpeg bracket and tighten the bolts to the specified torque.

TORQUE: 26 N•m (2.7 kgf•m, 20 lbf•ft)

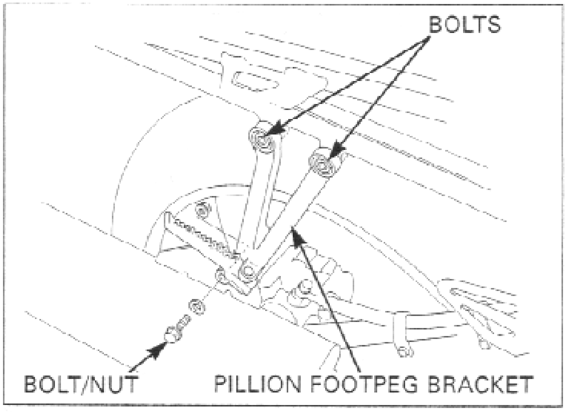


Install the left pillion footpeg bracket and tighten the bolts to the specified torque.

TORQUE: 26 N•m (2.7 kgf•m, 20 lbf•ft)

Install the muffler mounting bolt, washer and nut, and tighten the nut securely.

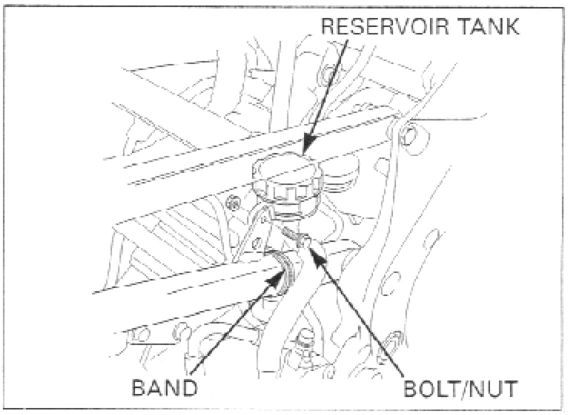
Install the regulator/rectifier (page 16-8).



Route the rear brake reservoir hose properly, install and tighten the bolt/nut to the specified torque.

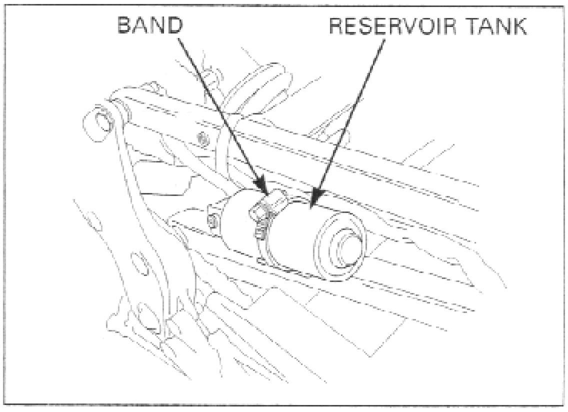
TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Clamp the rear brake light switch wire with the wire band.



Install the rear shock absorber reservoir with its compression adjuster facing out.
Tighten the band screw securely.

Install the removed parts in the reverse order of removal.

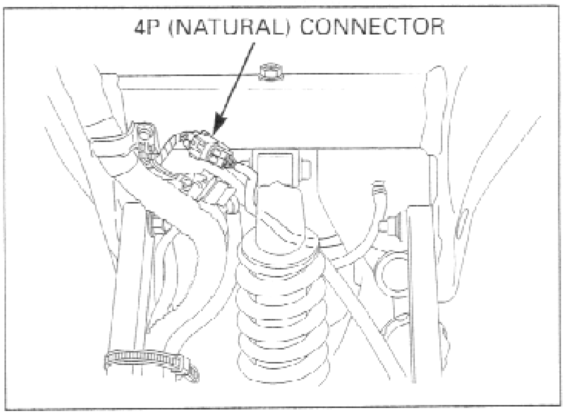


MUFFLER/EXHAUST PIPE

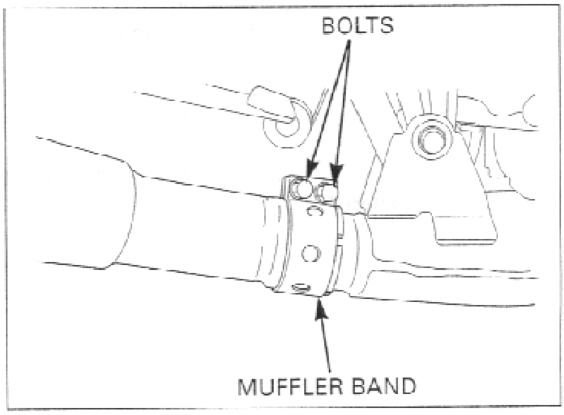
REMOVAL

Remove the lower cowl and inner half cowl (page 2-4).

California type only: Disconnect the O_2 sensor 4P (Natural) connector.
Remove the O_2 sensor wire from the frame.

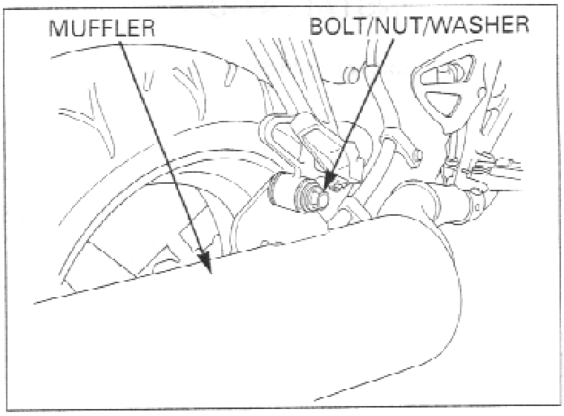


Loosen the muffler band bolts.

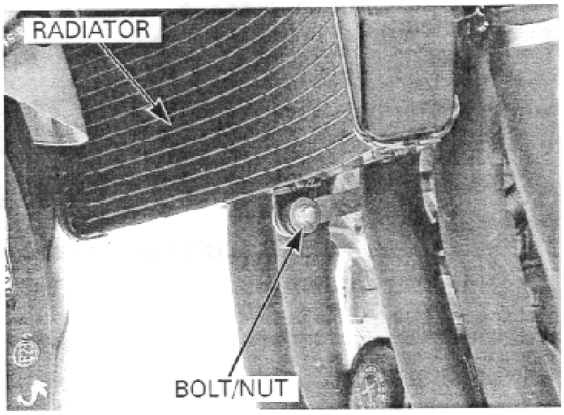


Remove the muffler mounting bolt/nut and washer, then remove the muffler.

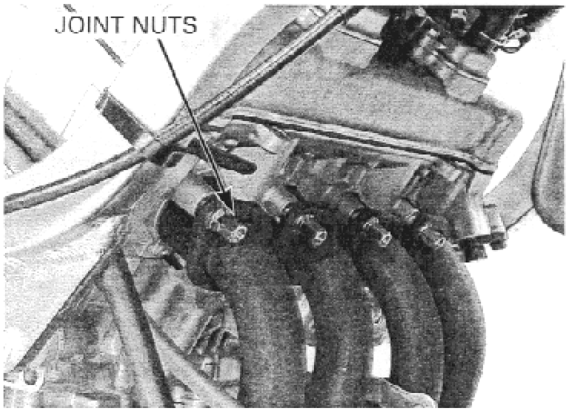
Remove the gasket.



Remove the radiator lower mounting bolt/nut, then move the radiator forward.

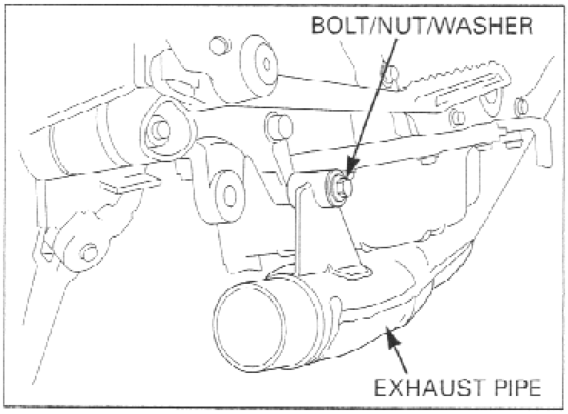


Remove the exhaust pipe joint nuts.



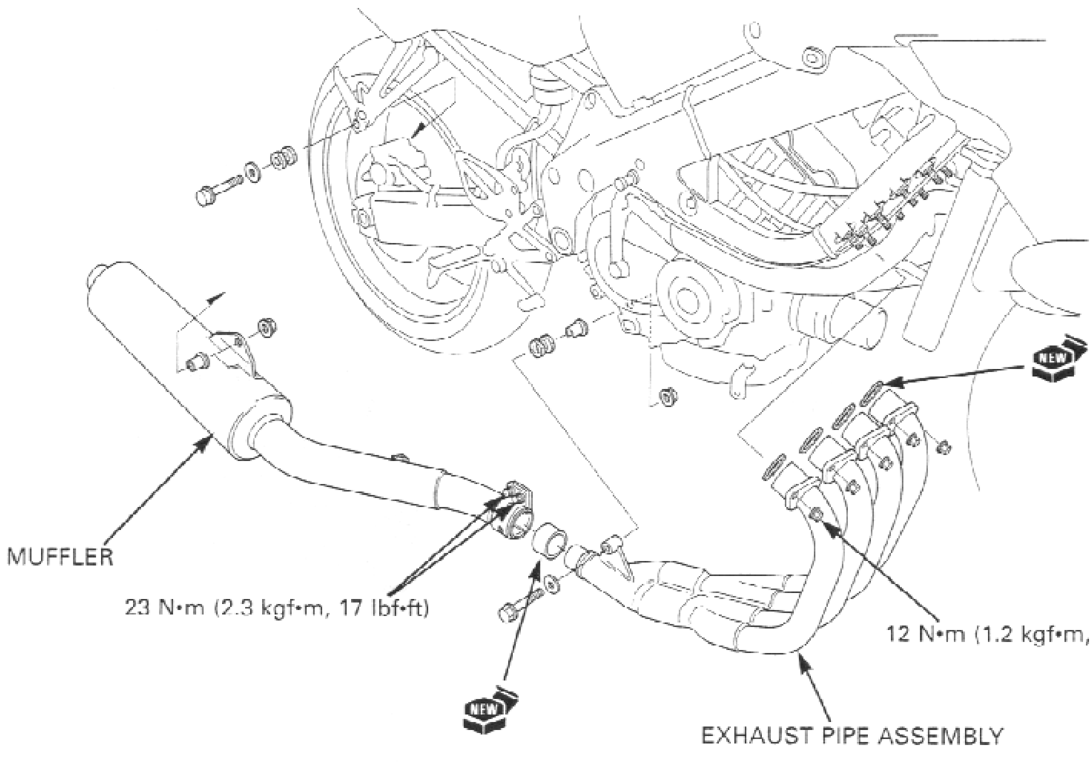
Remove the following:
- Exhaust pipe mounting bolt/nut
- Washer
- Exhaust pipe
- Exhaust pipe gaskets

Remove the collar and mounting rubbers from the exhaust pipe bracket.

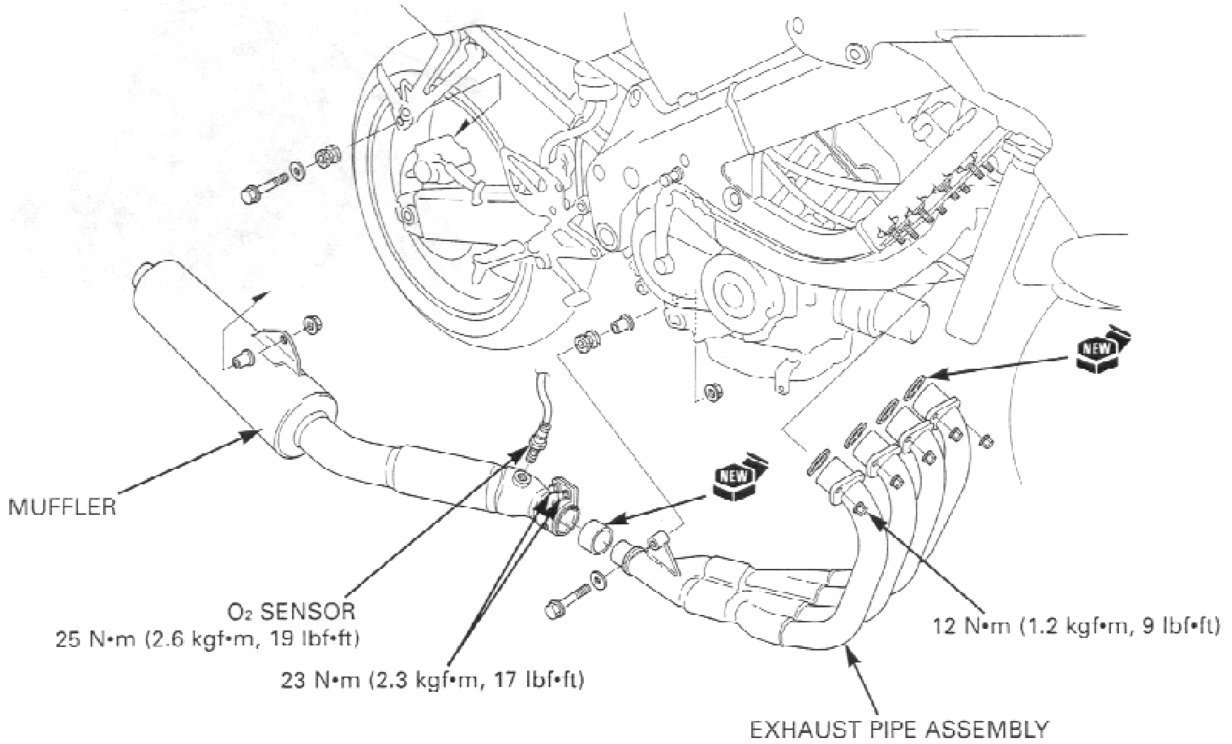


INSTALLATION

Except California type:

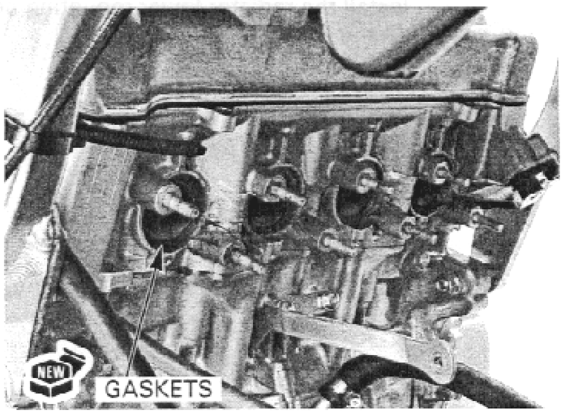


California type:



Always replace the exhaust pipe gaskets with new ones.

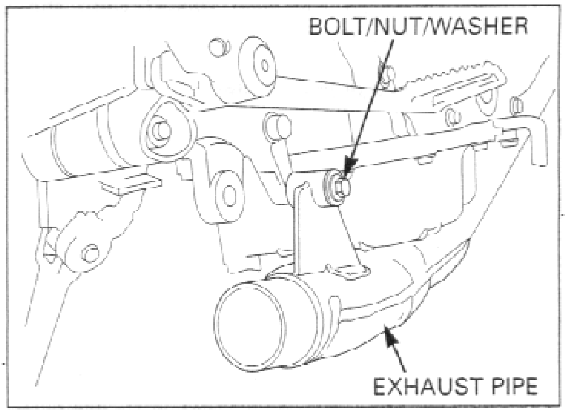
Install the new exhaust pipe gaskets onto the exhaust ports of the cylinder head.



Install the mounting rubbers and collar into the exhaust pipe mounting bracket.

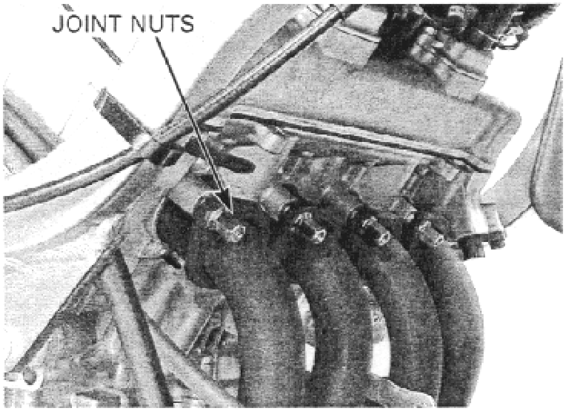
Install the washer, bolt and nut properly.

Install the exhaust pipe, temporarily install the exhaust pipe joint nuts, mounting washer and mounting bolt/nut.

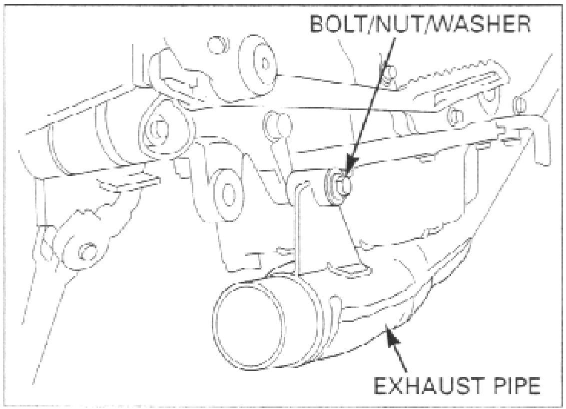


Tighten the exhaust pipe joint nuts to the specified torque.

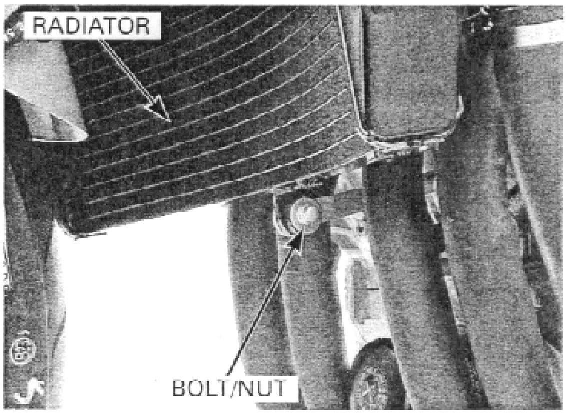
TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)



Tighten the exhaust pipe mounting bolt/nut.

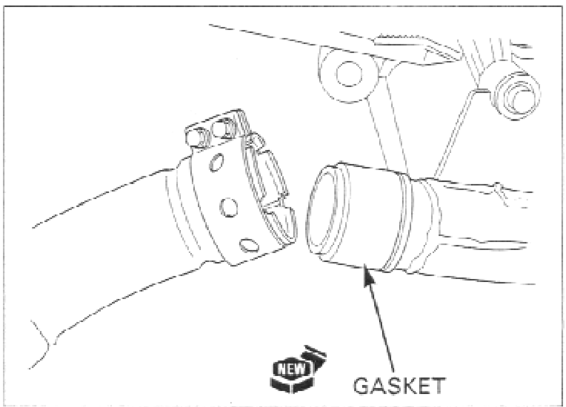


Install the radiator lower mounting bolt/nut and tighten the nut.



Install the new gasket onto the exhaust pipe as shown.

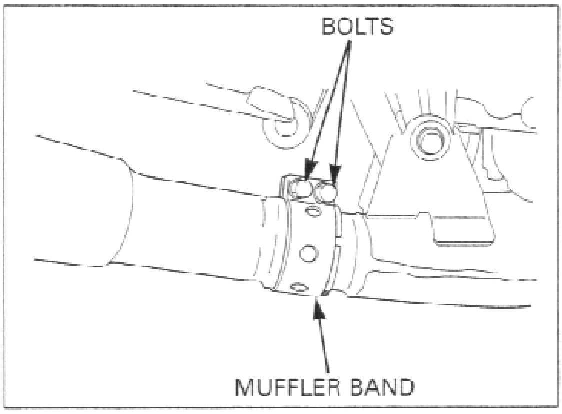
Install the muffler.



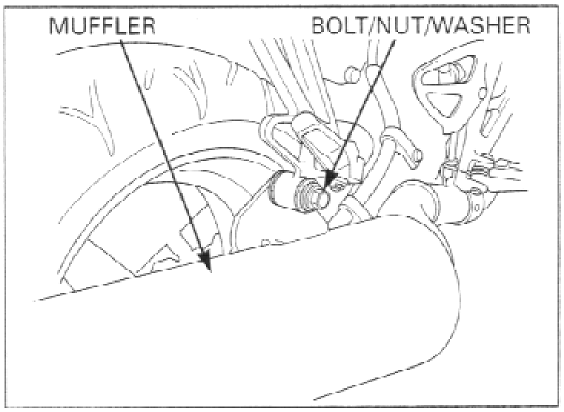
Temporarily install the muffler mounting bolt/nut.

Tighten the band band bolts to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

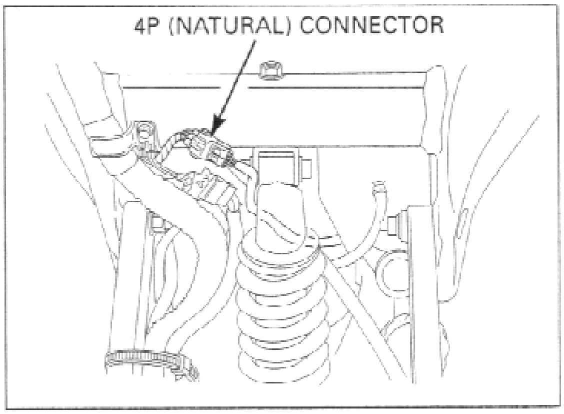


Tighten the muffler mounting bolt/nut securely.



California type only: Route the O_2 sensor wire into the frame.
Connect the O_2 sensor 4P (Natural) connector.

Install the inner half cowl and lower cowl (page 2-7)



MEMO

SERVICE INFORMATION

GENERAL

- Place the motorcycle on level ground before starting any work.
- Gasoline is extremely flammable and is explosive under certain conditions.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area.
- The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

SPECIFICATIONS

ITEM			SPECIFICATIONS
Throttle grip free play			2 – 6 mm (1/16 – 1/4 in)
Spark plug	NGK		IMR9A-9H
	DENSO		IUH27D
Spark plug gap			0.80 – 0.90 mm (0.031 – 0.035 in)
Valve clearance	IN		0.20 ± 0.03 mm (0.008 ± 0.001 in)
	EX		0.28 ± 0.03 mm (0.011 ± 0.001 in)
Engine oil capacity	After draining		3.0 liter (3.2 US qt, 2.6 Imp qt)
	After draining/oil filter change		3.3 liter (3.5 US qt, 2.9 Imp qt)
Recommended engine oil			Pro Honda GN4 or HP4 4-stroke oil (U.S.A. and Canada), or Honda 4-stroke oil (Canada only), or equivalent motor oil API service classification SF or SG Viscosity: SAE 10W–40
Engine idle speed			1,300 ± 100 rpm
Drive chain slack			25 – 35 mm (1 – 1-3/8 in)
Recommended brake fluid			DOT 4
Clutch lever free play			10 – 20 mm (3/8 – 13/16 in)
Tire size		Front	120/70 ZR 17 (58W)
		Rear	180/55 ZR 17 (73W)
Tire brand	Bridgestone	Front	BT010FF
		Rear	BT010RF
	Dunlop	Front	D207FJ
		Rear	D207P
	Michelin	Front	Pilot SPORT E
		Rear	Pilot SPORT E
Tire air pressure	Up to 90 kg (200 lb) load	Front	250 kPa (2.50 kgf/cm², 36 psi)
		Rear	290 kPa (2.90 kgf/cm², 42 psi)
	Up to maximum weight capacity	Front	250 kPa (2.50 kgf/cm², 36 psi)
		Rear	290 kPa (2.90 kgf/cm², 42 psi)
Minimum tire tread depth		Front	1.5 mm (0.06 in)
		Rear	2.0 mm (0.08 in)

TORQUE VALUES

Timing hole cap	18 N•m (1.8 kgf•m, 13 lbf•ft)	Apply grease to the threads.
Spark plug	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Cylinder head cover bolt	10 N•m (1.0 kgf•m, 7 lbf•ft)	
Engine oil drain bolt	29 N•m (3.0 kgf•m, 22 lbf•ft)	
Engine oil filter cartridge	26 N•m (2.7 kgf•m, 20 lbf•ft)	Apply clean engine oil to the O-ring.
Rear axle nut	93 N•m (9.5 kgf•m, 69 lbf•ft)	U–nut.
Drive sprocket special bolt	54 N•m (5.5 kgf•m, 40 lbf•ft)	
Final driven sprocket nut	64 N•m (6.5 kgf•m, 47 lbf•ft)	U-nut.
Rear master cylinder push rod joint nut	18 N•m (1.8 kgf•m, 13 lbf•ft)	

TOOLS

Oil filter wrench	07HAA–PJ70100
Drive chain tool set	07HMH-MR10103 or 07HMH–MR1010B (U.S.A. only)

MAINTENANCE SCHEDULE

Perform the Pre-ride inspection in the Owner's Manual at each scheduled maintenance period.
I: Inspect and Clean, Adjust, Lubricate or Replace if necessary. C: Clean. R: Replace. A: Adjust. L: Lubricate.
The following items require some mechanical knowledge. Certain items (particularly those marked * and **) may require more technical information and tools. Consult their authorized HONDA dealer.

ITEMS		FREQUENCY	NOTE	ODOMETER READING (NOTE 1)								REFER TO PAGE
			⇩	X1,000 mi	0.6	4	8	12	16	20	24	
				X100 km	10	64	128	192	256	320	384	
EMISSION RELATED ITEMS	*	FUEL LINE					I		I		I	3-4
	*	THROTTLE OPERATION					I		I		I	3-4
	*	AIR CLEANER	NOTE 2					R			R	3-5
		SPARK PLUG					I		R		I	3-6
	*	VALVE CLEARANCE							I			3-9
		ENGINE OIL			R		R		R		R	3-14
		ENGINE OIL FILTER			R		R		R		R	3-14
	*	ENGINE IDLE SPEED			I	I	I	I	I	I	I	3-17
		RADIATOR COOLANT	NOTE 4				I		I		R	3-17
	*	COOLING SYSTEM					I		I		I	3-17
	*	SECONDARY AIR SUPPLY SYSTEM					I		I		I	3-18
	*	EVAPORATIVE EMISSION CONTROL SYSTEM	NOTE 3					I			I	3-19
NON-EMISSION RELATED ITEMS		DRIVE CHAIN			EVERY 500 mi (800 km) I, L							3-19
		BRAKE FLUID	NOTE 4			I	I	R	I	I	R	3-23
		BRAKE PAD WEAR				I	I	I	I	I	I	3-24
		BRAKE SYSTEM			I		I		I		I	3-24
	*	BRAKE LIGHT SWITCH					I		I		I	3-25
	*	HEADLIGHT AIM					I		I		I	3-25
		CLUTCH SYSTEM			I	I	I	I	I	I	I	3-26
		SIDE STAND					I		I		I	3-26
	*	SUSPENSION					I		I		I	3-27
	*	NUTS, BOLTS, FASTENERS			I		I		I		I	3-30
	**	WHEELS/TIRES					I		I		I	3-30
	**	STEERING HEAD BEARINGS			I		I		I		I	3-31

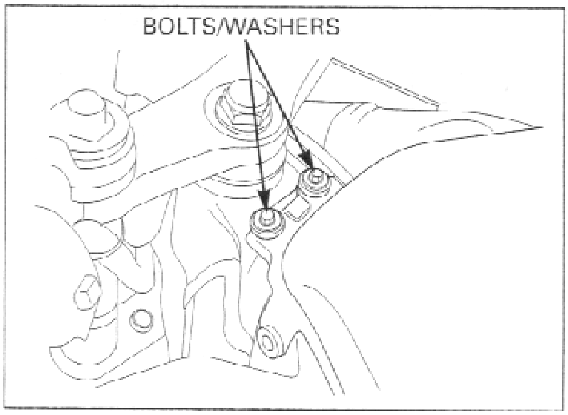
* Should be serviced by an authorized HONDA dealer, unless the owner has proper tools and service data and is mechanically qualified.
** In the interest of safety, we recommend these items be serviced only by an authorized HONDA dealer.

NOTES:
1. At higher odometer reading, repeat at the frequency interval established here.
2. Service more frequently if the motorcycle is ridden in unusually wet or dusty areas.
3. California type only.
4. Replace every 2 years, or at indicated odometer interval, whichever comes first. Replacement requires mechanical skill.

FUEL LINE

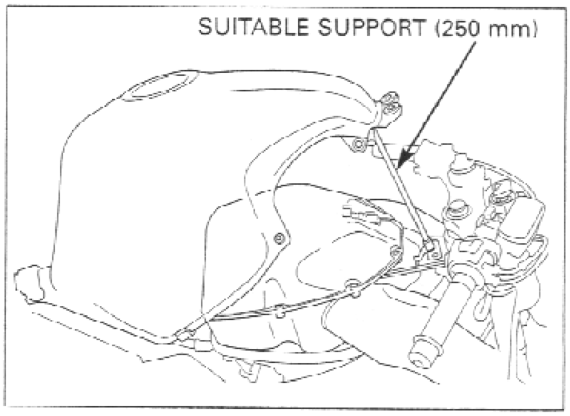
Remove the air duct covers (page 2-7).

Remove the fuel tank front mounting bolts.



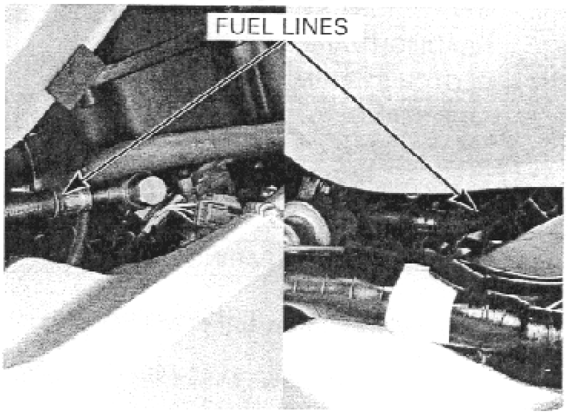
Lift the fuel tank slowly, being careful not to overextened the fuel hose.

Open and support the front end of the fuel tank using a suitable support (250-mm) as shown.



Check the fuel lines for deterioration, damage or leakage. Replace the fuel line if necessary.

Install the fuel tank in the reverse order of removal.

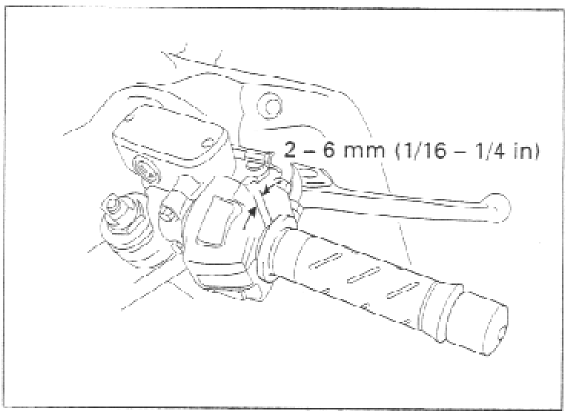


THROTTLE OPERATION

Check for smooth throttle grip full opening and automatic full closing in all steering positions.
Check the throttle cables and replace them if they are deteriorated, kinked or damaged.
Lubricate the throttle cables, if throttle operation is not smooth.

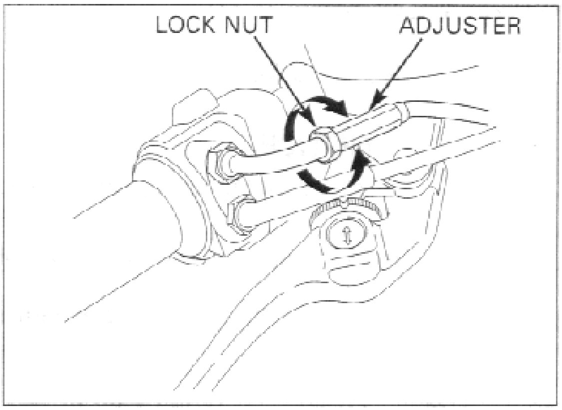
Measure the free play at the throttle grip flange.

FREE PLAY: 2 – 6 mm (1/16 – 1/4 in)



Throttle grip free play can be adjusted at either end of the throttle cable.

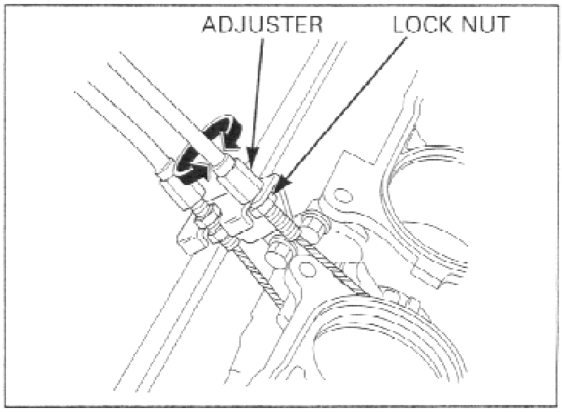
Minor adjustments are made with the upper adjuster. Adjust the free play by loosening the lock nut and turning the adjuster.



Major adjustments are made with the lower adjuster.

Remove the air cleaner housing (page 5-60).

Adjust the free play by loosening the lock nut and turning the adjuster.
After adjustment, tighten the lock nut securely.
Recheck the throttle operation.
Replace any damaged parts, if necessary.

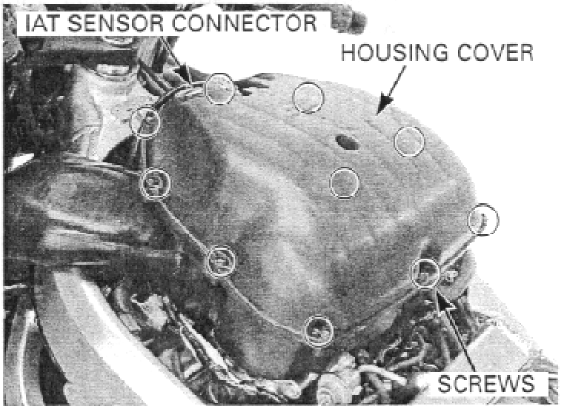


AIR CLEANER

Support the front end of fuel tank (page 3-4).

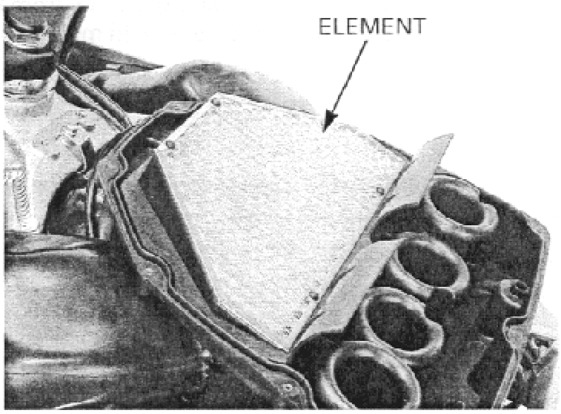
Disconnect the IAT (Intake Air Temperature) sensor connector.

Remove the screws and air cleaner housing cover.



Remove and discard the air cleaner element in accordance with the maintenance schedule (page 3-3).
Also replace the air cleaner element any time it is excessively dirty or damage.

Install the removed parts in the reverse order of removal.



SPARK PLUG

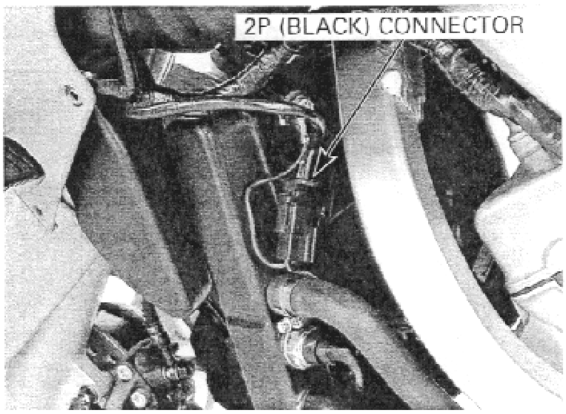
REMOVAL

NOTICE

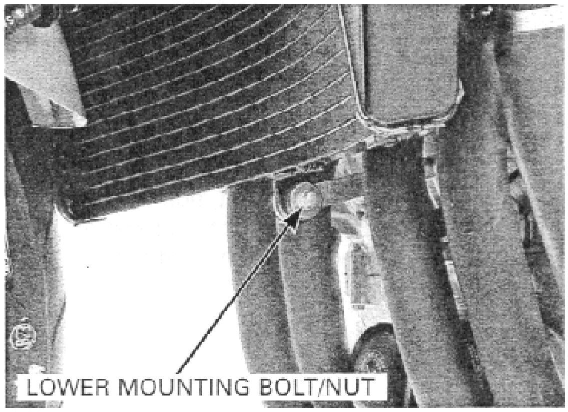
Be careful not to damage the radiator fins.

Remove the lower cowl and inner half cowl (page 2-4).

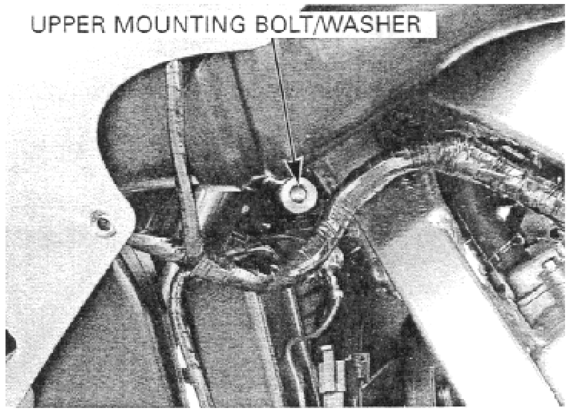
Disconnect the fan motor sub-harness 2P (Black) connector.



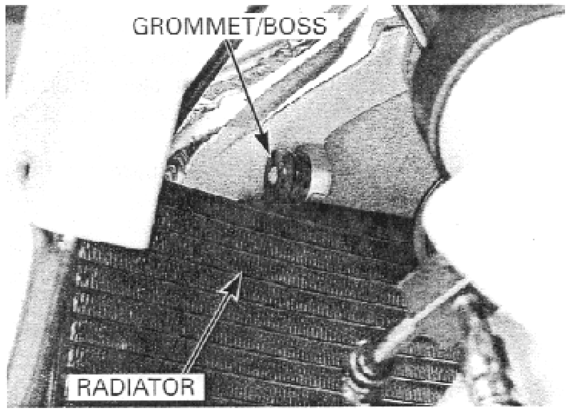
Remove the radiator lower mounting bolt, nut and washer.



Remove the radiator upper mounting bolt and washer.

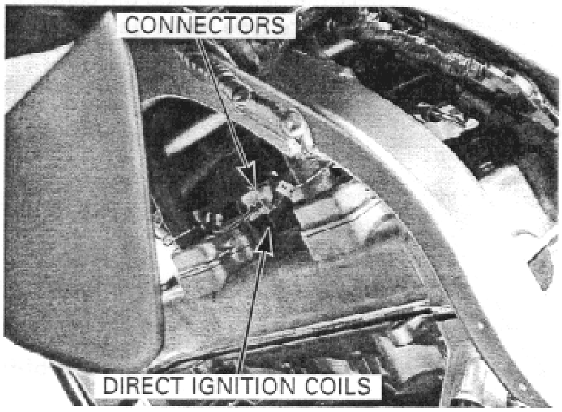


Remove the radiator grommet from the frame boss by moving it to the right, then move the radiator forward.



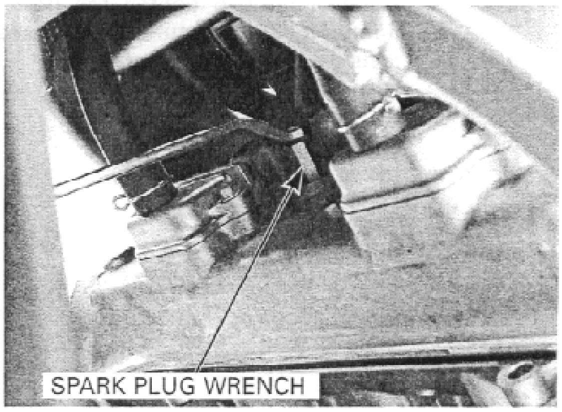
Clean around the spark plug bases with compressed air before removing the spark plugs, and be sure that no debris is allowed to enter the combustion chamber.

Disconnect the direct ignition coil connectors.
Remove the direct ignition coils from the spark plug.



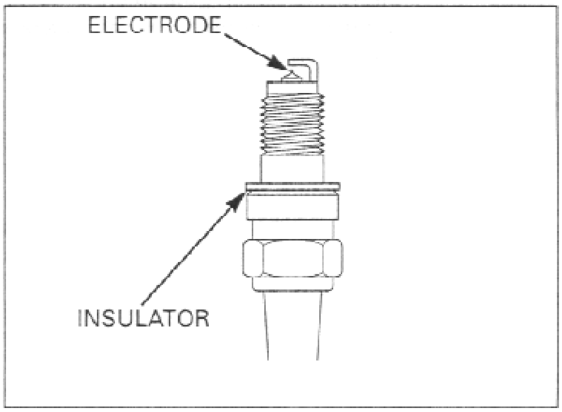
Remove the spark plug using the spark plug wrench in the tool kit or an equivalent tool.

Inspect or replace the spark plugs as described in the maintenance schedule.



INSPECTION

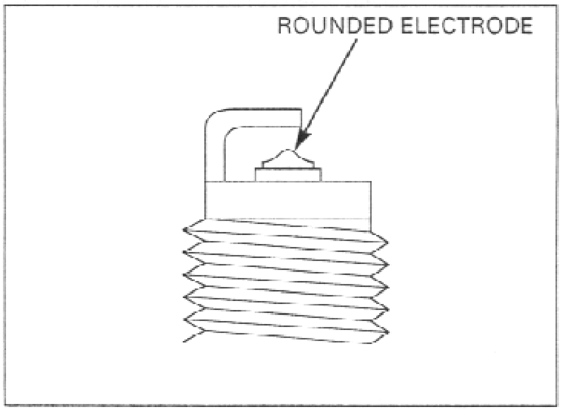
Check the following and replace if necessary (recommended spark plug: page 3-2)
- Insulator for damage
- Electrodes for wear
- Burning condition, coloration



This motorcycle's spark plug is equipped with an iridium center electrode. Replace the spark plug if the electrodes are contaminated.

If the electrodes are contaminated with accumulated objects or dirt, replace the spark plug.

Replace the plug if the center electrode is rounded as shown in the illustration.



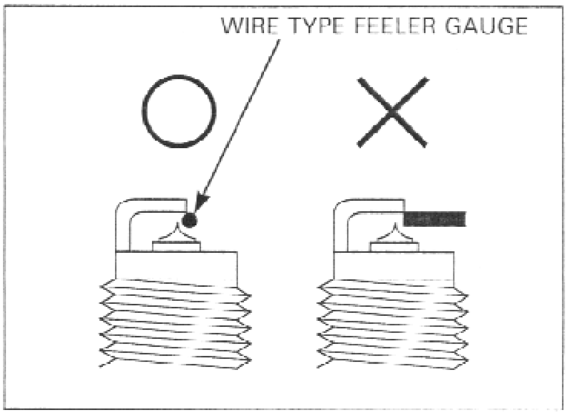
Always use specified spark plugs on this motorcycle.

SPECIFIED SPARK PLUG:
NGK: IMR9A-9H
DENSO: IUH27D

To prevent damaging the iridium center electrode, use a wire type feeler gauge to check the spark plug gap.

Check the gap between the center and side electrodes with a wire type feeler gauge.

Make sure that the ø 1.0 mm (0.04 in) plug gauge does not go between the gap.



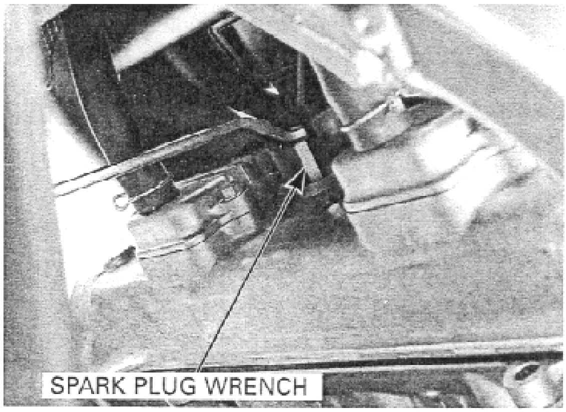
Do not adjust the spark plug gap. If the gap is out of specification, replace with it a new one.

If the gauge can be inserted into the gap, replace the plug with a new one.

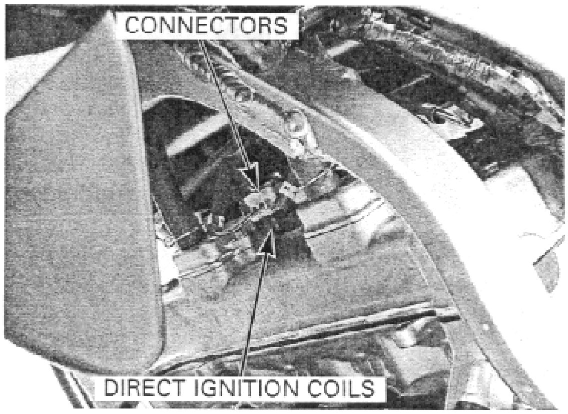
Reinstall the spark plug in the cylinder head and hand tighten, then torque to specification.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

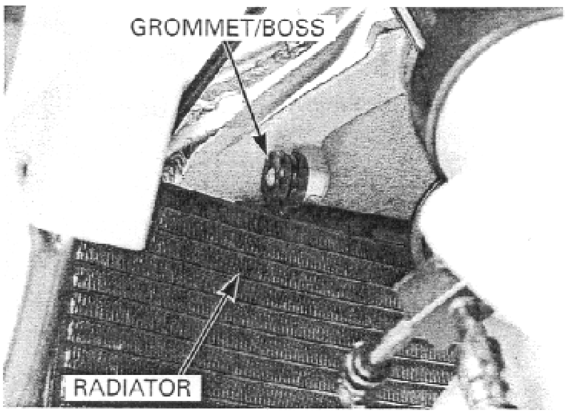
If using the new plug, install as follows:
Install and hand tighten the new spark plug, then tighten it about 1/2 turn after the sealing washer contacts the seat of the plug hole.



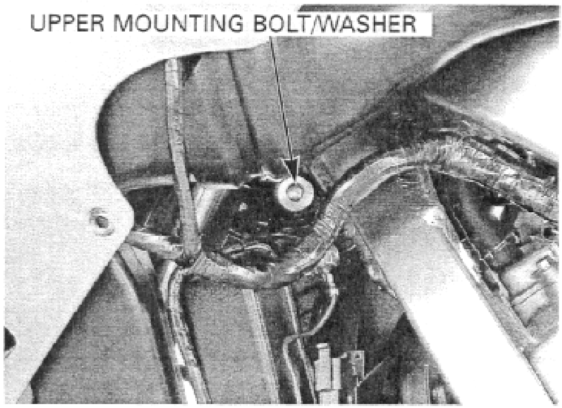
Install the direct ignition coils.
Connect the connectors to the associated direct ignition coil.



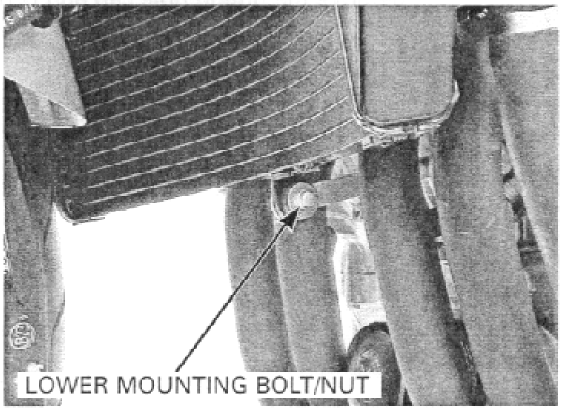
Install the radiator grommet onto the frame boss.



Install the washer and radiator upper mounting bolt, then tighten the bolt.

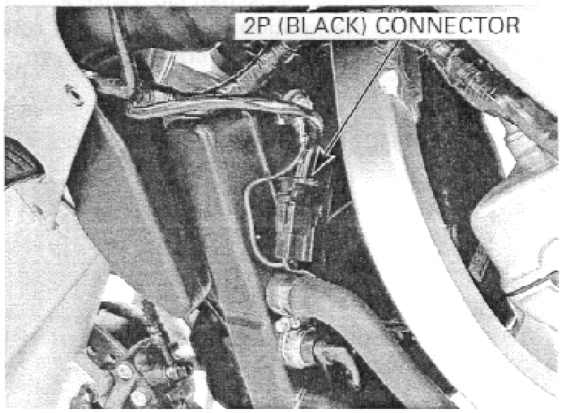


Install and tighten the radiator lower mounting bolt/nut.



Connect the fan motor sub-harness 2P (Black) connector.

Install the inner half cowl and lower cowl (page 2 5).



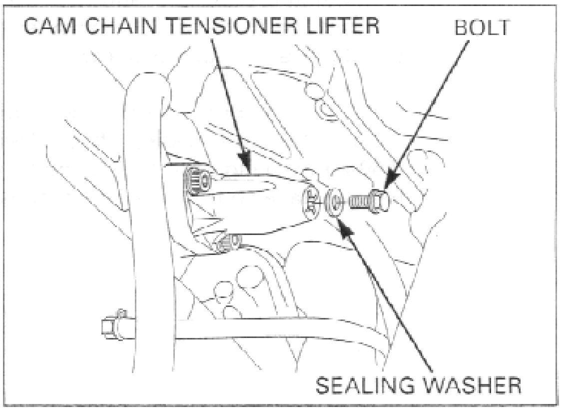
VALVE CLEARANCE

Inspect and adjust the valve clearance while the engine is cold (below 35°C/95°F).

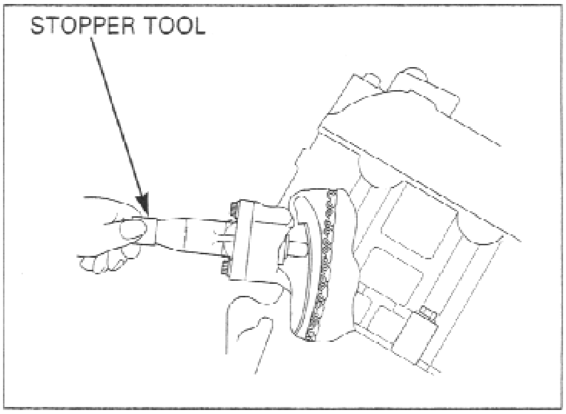
INSPECTION

Remove the cylinder head cover (page 8-4)

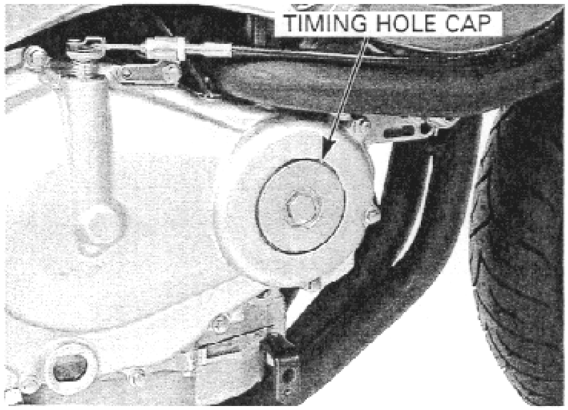
Remove the cam chain tensioner lifter sealing bolt and sealing washer.



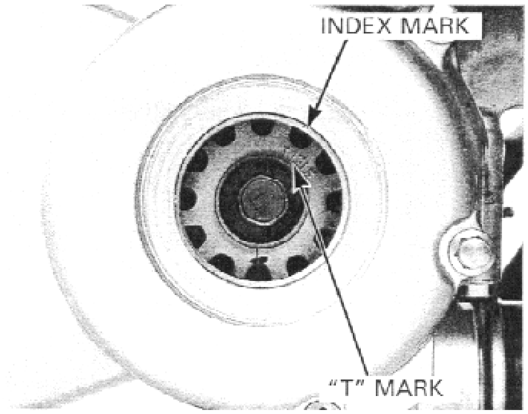
Turn the cam chain tensioner lifter shaft fully and secure it using the mechanic's tensioner stopper tool (page 8-7).



Remove the timing hole cap and O-ring.

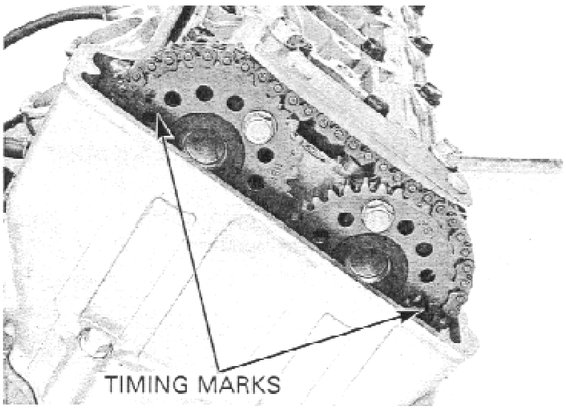


Turn the crankshaft clockwise and align the "T" mark on the ignition pulse generator rotor with the index mark on the right crankcase cover.



The timing marks ("IN" and "EX") on the cam sprockets must be flush with the cylinder head surface and should face outward as shown.

If the timing marks on the cam sprocket are facing inward, turn the crankshaft clockwise one full turn (360°) and realign the timing marks with the cylinder head surface so they are facing outward.

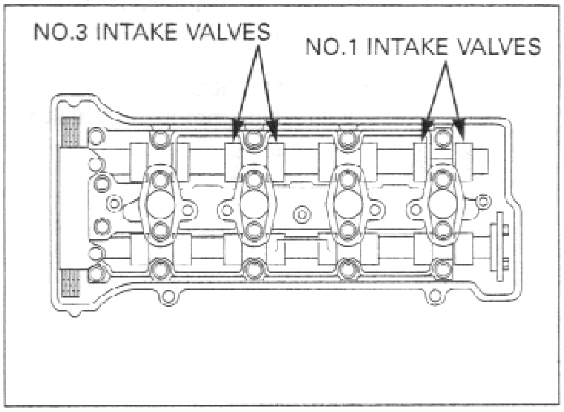


Insert the feeler gauge between the valve lifter and the cam lobe.

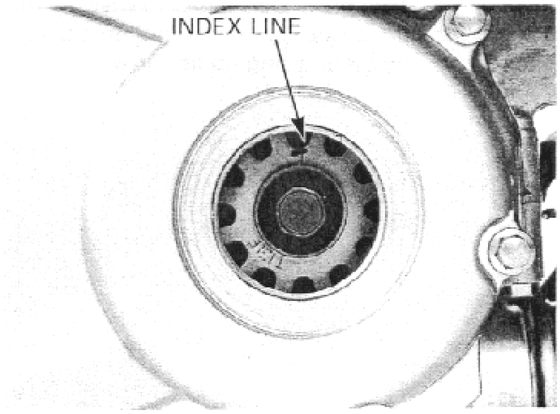
Record the clearance for each valve for reference if valve clearance adjustment is required.

Check the valve clearance for the No.1 and No.3 cylinder intake valves using a feeler gauge.

VALVE CLEARANCE:
IN: 0.20 ± 0.03 mm (0.008 ± 0.001 in)



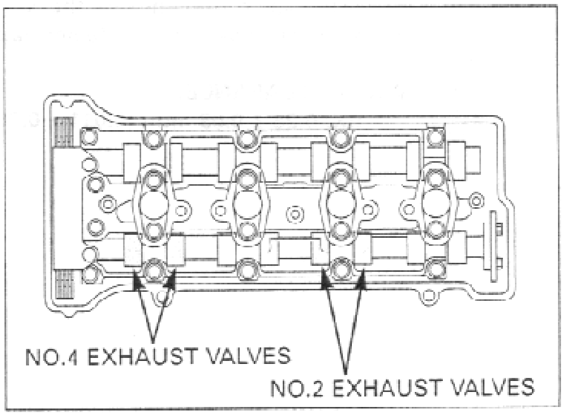
Turn the crankshaft clockwise 1/2 turn (180°) and align the index line on the ignition pulse generator rotor so it is facing up as shown.



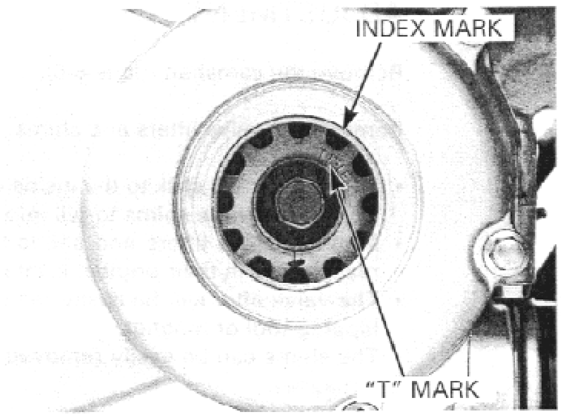
Record the clearance for each valve for reference if valve clearance adjustment is required.

Check the valve clearance for the No.2 and No.4 cylinder exhaust valves using a feeler gauge.

VALVE CLEARANCE:
EX: 0.28 ± 0.03 mm (0.011 ± 0.001 in)



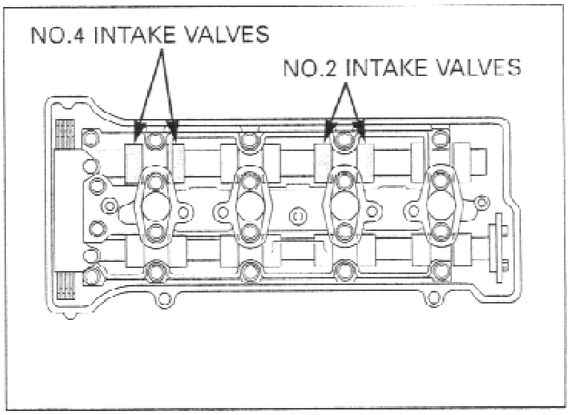
Turn the crankshaft clockwise 1/2 turn (180°) and align the "T" mark on the ignition pulse generator rotor with the index mark on the right crankcase cover.



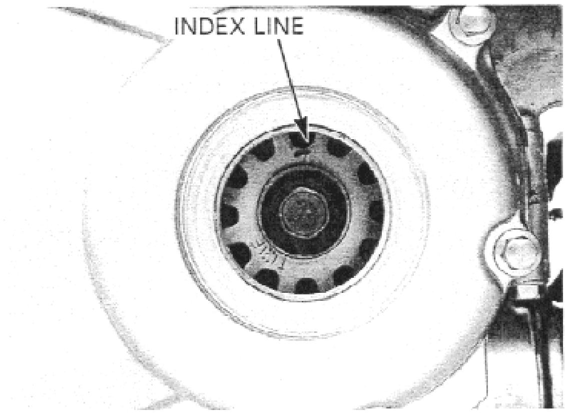
Record the clearance for each valve for reference if valve clearance adjustment is required.

Check the valve clearance for the No.2 and No.4 cylinder intake valves using feeler gauge.

VALVE CLEARANCE:
IN: 0.20 ± 0.03 mm (0.008 ± 0.001 in)



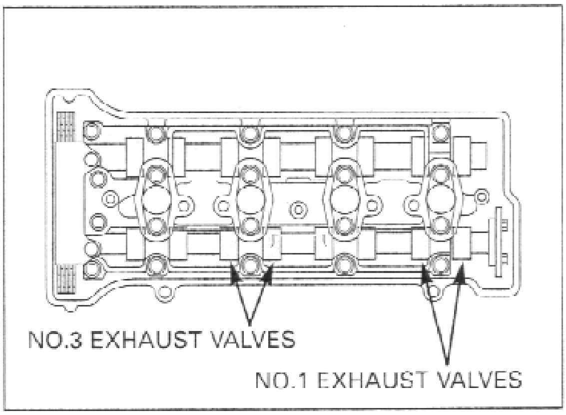
Turn the crankshaft clockwise 1/2 turn (180°) and align the index line on the ignition pulse generator rotor so that it is facing up as shown.



Record the clearance for each valve for reference if valve clearance adjustment is required.

Check the valve clearance for the No.1 and No.3 cylinder exhaust valves using a feeler gauge.

VALVE CLEARANCE:
EX: 0.28 ± 0.03 mm (0.011 ± 0.001 in)

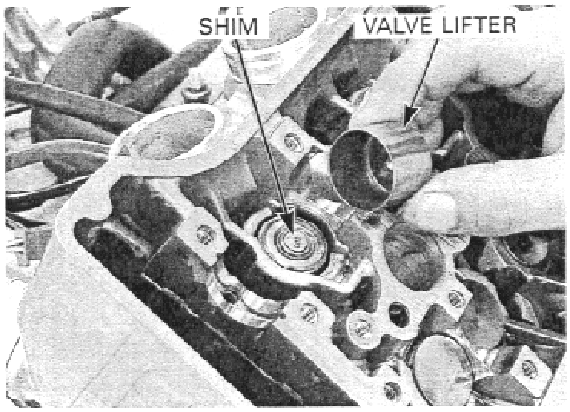


ADJUSTMENT

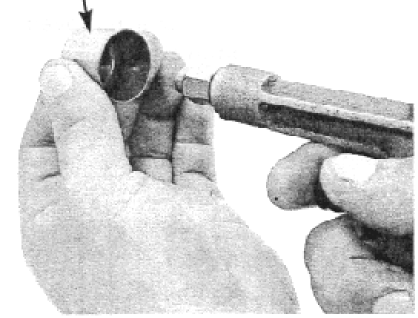
Remove the camshaft (page 8-6).

Remove the valve lifters and shims.

- The shims may stick to the inside of the valve lifter. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.
- The shims can be easily removed with tweezers or a magnet.



Clean the valve shim contact area in the valve lifter with compressed air.



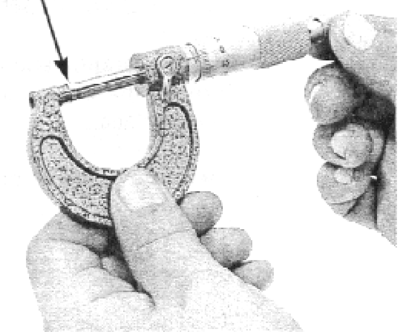
Sixty-five different shim thicknesses are available from 1.200 mm to 2.800 mm in intervals of 0.025 mm.

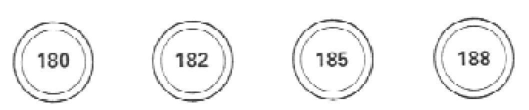
Measure the shim thickness and record it.

Calculate the new shim thickness using the equation below.
A = (B – C) + D

A: New shim thickness
B: Recorded valve clearance
C: Specified valve clearance
D: Old shim thickness

- Make sure the correct shim is selected by measuring it with a micrometer.
- Reface the valve seat if carbon deposits result in a clearance over 2.800 mm.





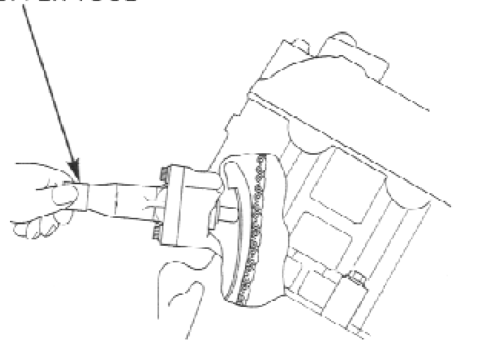
Install the shims and valve lifters in their original locations.

Install the newly selected shim on the valve retainer.
Apply molybdenum disulfide oil to the valve lifters.
Install the valve lifters into the valve lifter holes.

Install the camshaft (page 8-23).

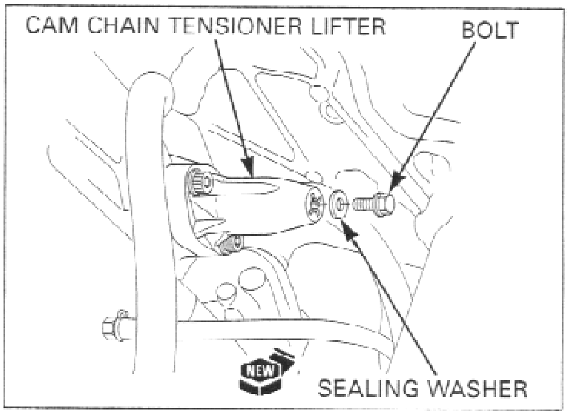
Rotate the camshafts by rotating the crankshaft clockwise several times.
Recheck the valve clearance.

Remove the cam chain tensioner stopper tool.



Install the new sealing washer and cam chain tensioner lifter sealing bolt.
Tighten the bolt securely.

Install the removed parts in the reverse order of removal.

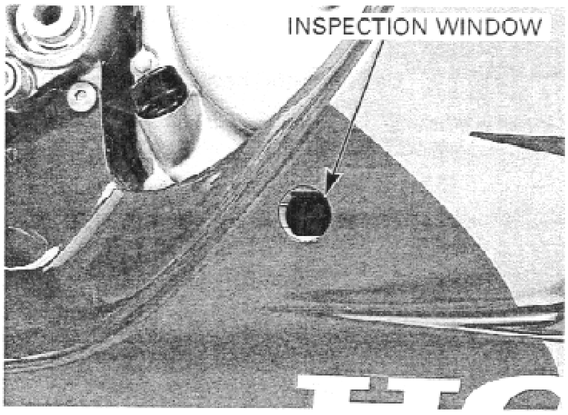


ENGINE OIL/OIL FILTER

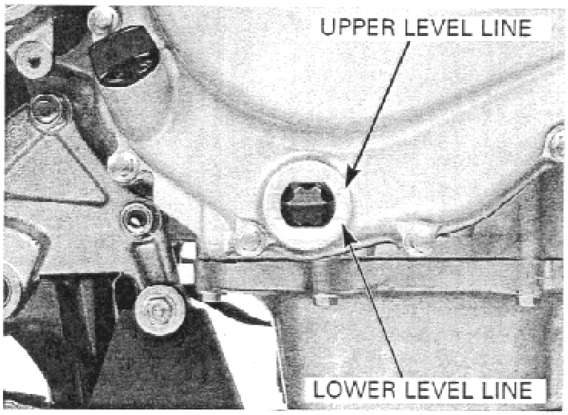
OIL LEVEL INSPECTION

Start the engine and let it idle for 2 – 3 minutes.
Turn off the engine and support the motorcycle on a level surface.

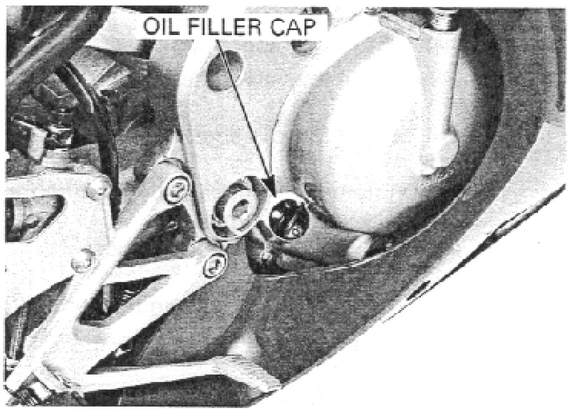
Check the oil level through the inspection window.



If the level is below the lower line, remove the oil filler cap and fill the crankcase with the recommended oil to the upper level line.



Remove the oil filler cap.

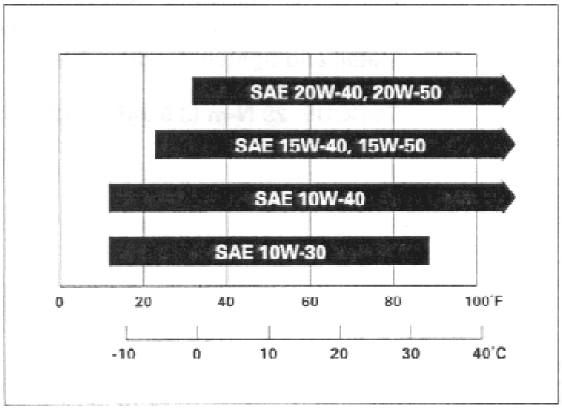


Add the recommended engine oil until the oil level is to the upper level line.

Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.

RECOMMENDED ENGINE OIL:
Pro Honda GN4 or HP4 4-stroke oil (U.S.A. and Canada), or Honda 4-stroke oil (Canada only), or equivalent motor oil
API service classification: SF or SG
Viscosity: 10W–40

Reinstall the filler cap.

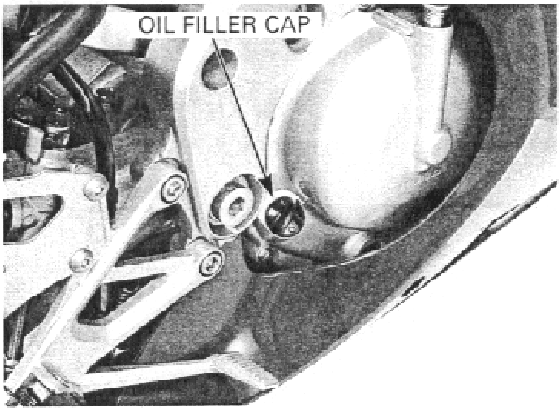


ENGINE OIL & FILTER CHANGE

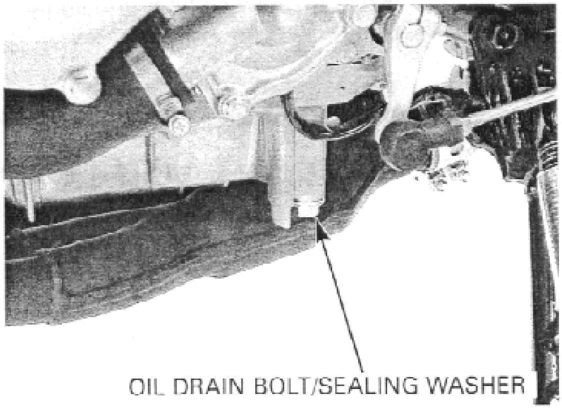
Warm up the engine.
Remove the lower cowl (page 2-4).

Change the engine oil with the engine warm and the motorcycle on level ground to assure complete draining.

Stop the engine and remove the oil filler cap.

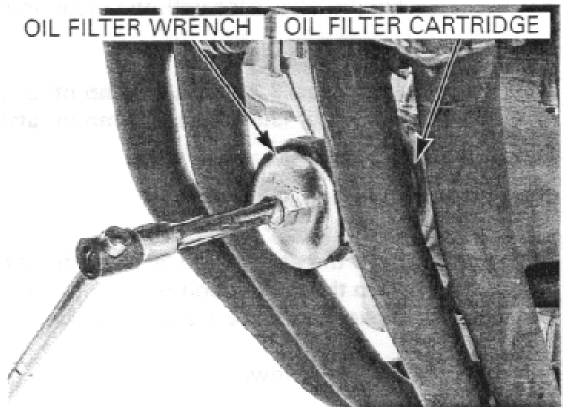


Remove the drain bolt and drain the oil completely.



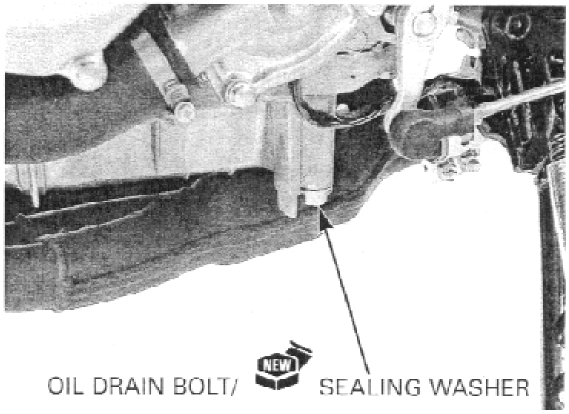
Remove and discard the oil filter cartridge using the special tool.

TOOL:
Oil filter wrench **07HAA–PJ70100**



Check that the sealing washer on the drain bolt is in good condition and replace if necessary.
Install and tighten the drain bolt.

TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

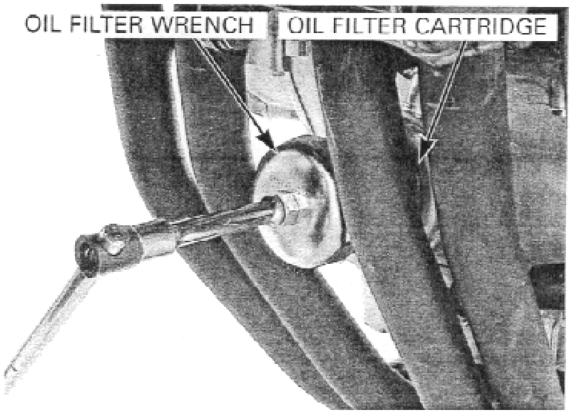


Apply clean engine oil to the new oil filter O-ring.

Install the new oil filter and tighten it to the specified torque.

TOOL:
Oil filter wrench 07HAA–PJ70100

TORQUE: 26 N·m (2.7 kgf·m, 20 lbf·ft)



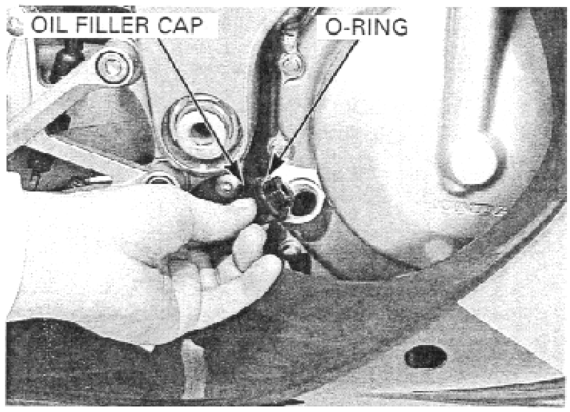
Fill the crankcase with the recommended engine oil.

OIL CAPACITY:
3.0 liter (3.2 US qt, 2.6 Imp qt) after draining
3.3 liter (3.5 US qt, 2.9 Imp qt) after draining/filter change

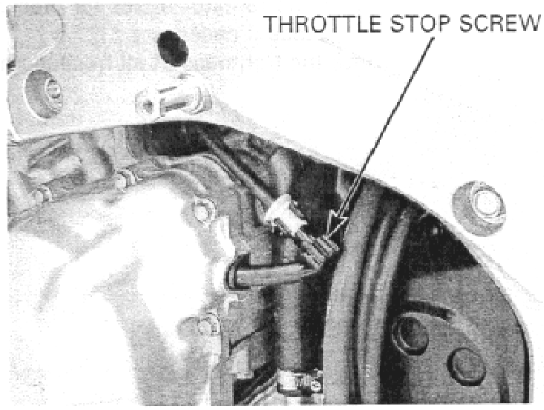
Install the oil filler cap.

Start the engine and let it idle for 2 to 3 minutes.
Stop the engine and recheck the oil level.
Make sure there are no oil leaks.

Install the lower cowl (page 2-5).



ENGINE IDLE SPEED

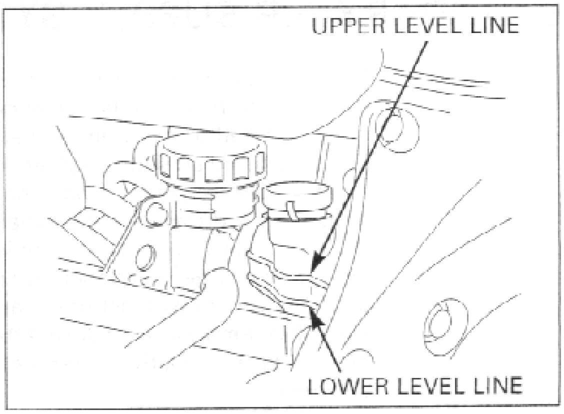


- Inspect and adjust the idle speed after all other engine maintenance items have been performed and are within specification.
- The engine must be warm for accurate idle speed inspection and adjustment.

Warm up the engine for about 10 minutes.
Turn the throttle stop screw as required to obtain the specified idle speed.

IDLE SPEED: 1,300 ± 100 rpm

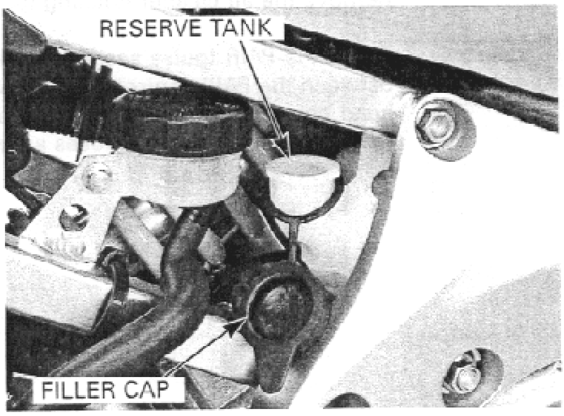
RADIATOR COOLANT



Check the coolant level in the reserve tank with the engine running at normal operating temperature.
The level should be between the "UPPER" and "LOWER" level lines.

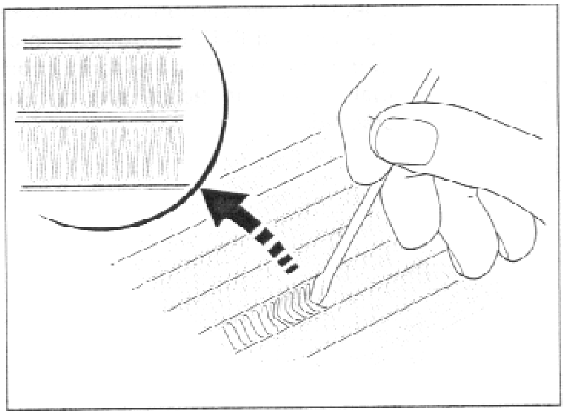
If necessary, add the recommended coolant.

RECOMMENDED ANTIFREEZE:
Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing corrosion protection inhibitors.



Remove the reserve tank filler cap and fill to the "UPPER" level line with a 1/1 mixture of distilled water and antifreeze.
Reinstall the filler cap.

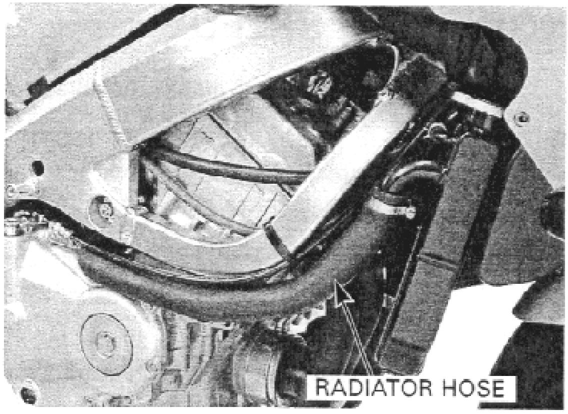
COOLING SYSTEM



Remove the lower cowl and inner half cowl (page 2-4).

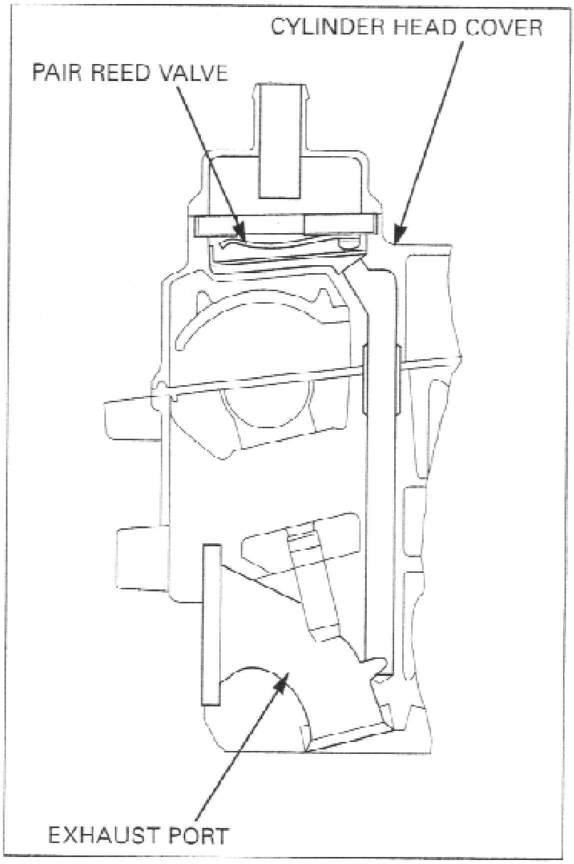
Check the radiator air passages for clogs or damage.
Straighten any bent fins, and remove insects, mud or other obstructions with compressed air or low water pressure.
Replace the radiator if the air flow is restricted over more than 20% of the radiating surface.

Inspect the radiator hoses for cracks or deterioration, and replace if necessary.
Check the tightness of all hose clamps and fasteners.



SECONDARY AIR SUPPLY SYSTEM

- This model is equipped with a built-in secondary air supply system. The pulse secondary air supply system is located on the cylinder head cover.
- The secondary air supply system introduces filtered air into exhaust gases in the exhaust port. The secondary air is drawn into the exhaust port whenever there is negative pressure pulse in the exhaust system. This charged secondary air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water.

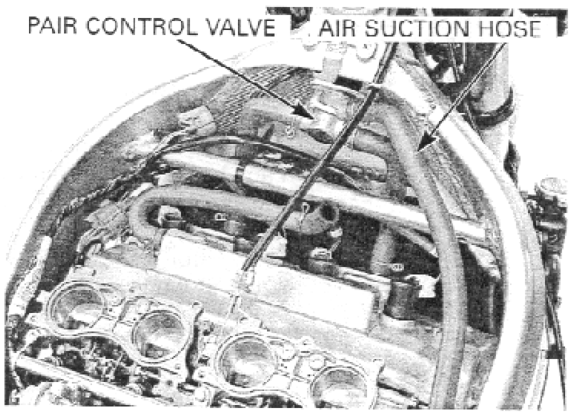


Remove the air cleaner housing (page 5-60).

If the hoses show any signs of heat damage, inspect the PAIR check valve in the PAIR reed valve cover for damage.

Check the PAIR (pulse secondary air injection) hoses between the PAIR control solenoid valve and cylinder head cover for deterioration, damage or loose connections. Make sure the hoses are not cracked.

Check the air suction hose between the air cleaner housing and PAIR control solenoid valve for deterioration, damage or loose connections.
Make sure the hoses are not kinked, pinched or cracked.

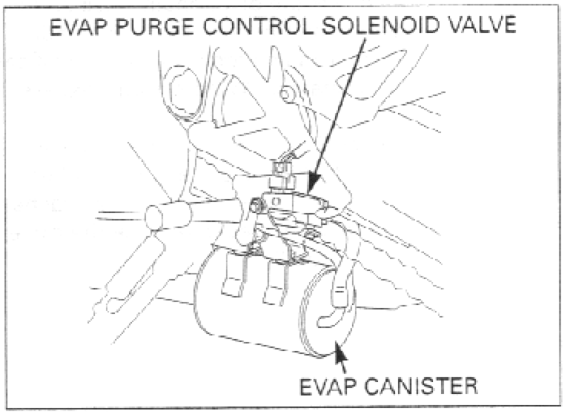


EVAPORATIVE EMISSION CONTROL SYSTEM (CALIFORNIA TYPE ONLY)

Check the hoses between the fuel tank, EVAP canister, EVAP purge control solenoid valve for deterioration, damage or loose connections.

Check the EVAP canister for cracks or other damage.

Refer to the Vacuum Hose Routing Diagram Label (page 1-41) and Cable & Harness Routing (page 1-23) for hose connections.



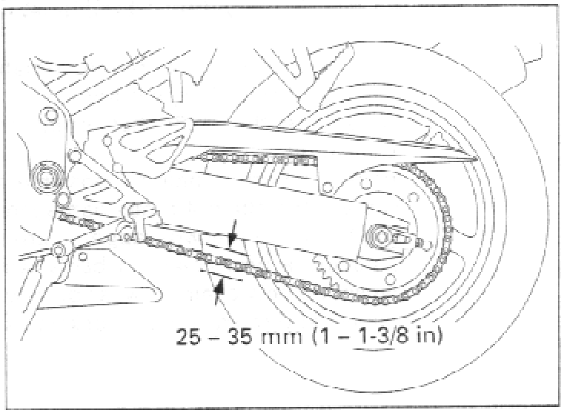
DRIVE CHAIN

Never inspect and adjust the drive chain while the engine is running.

DRIVE CHAIN SLACK INSPECTION

Turn the ignition switch to "OFF", place the motorcycle on its side stand and shift the transmission into neutral.
Check the slack in the drive chain lower run midway between the sprockets.

CHAIN SLACK: 25 – 35 mm (1 – 1-3/8 in)



NOTICE

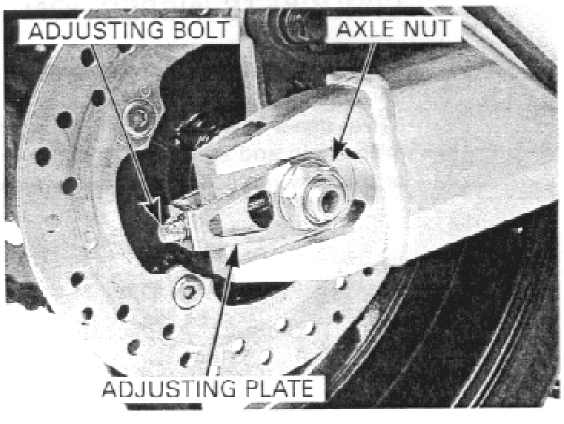
Excessive chain slack, 50 mm (2.0 in) or more, may damage the frame.

Lubricate the drive chain with #80 – 90 gear oil or Pro Honda chain lube designed specifically for use with O-ring chains. Wipe off any excess oil or chain lubricant.

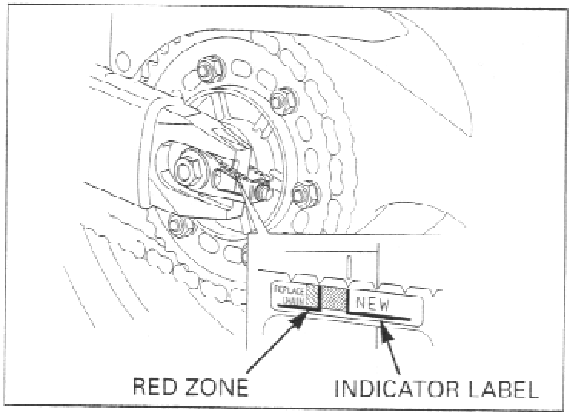
ADJUSTMENT

Loosen the rear axle nut.
Turn both adjusting bolts until the correct drive chain slack is obtained.
Make sure the index marks on both adjusting plates are aligned with the end of the swingarm.
Tighten the rear axle nut to the specified torque.

TORQUE: 93 N·m (9.5 kgf·m, 69 lbf·ft)

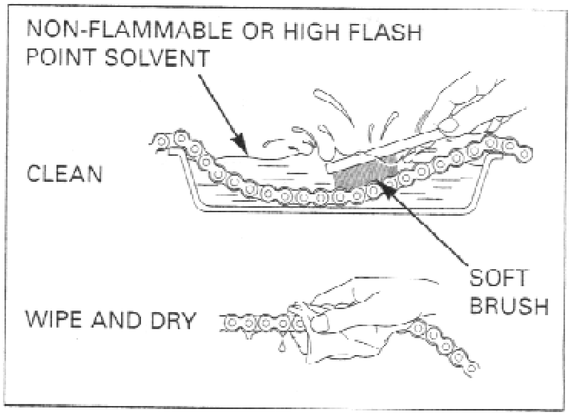


Recheck the drive chain slack and free wheel rotation.
Lubricate the drive chain with #80 – 90 gear oil or Pro Honda chain lube designed specifically for use with O-ring chains. Wipe off any excess oil or chain lubricant.
Check the drive chain wear indicator label attached on the left drive chain adjusting plate.
If the swingarm index mark reaches the red zone on the indicator label, replace the drive chain with a new one (page 3-21).

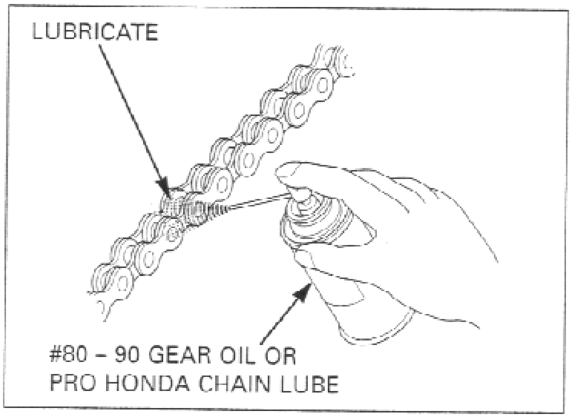


CLEANING AND LUBRICATION

Clean the chain with non-flammable or high flash point solvent and wipe it dry.
Make sure the chain has dried completely before lubricating.
Inspect the drive chain for possible damage or wear. Replace the chain if it has damaged rollers, loose fitting links, or otherwise appears unserviceable.
Installing a new chain on badly worn sprockets will cause the new chain to wear quickly.
Inspect and replace the sprockets as necessary.

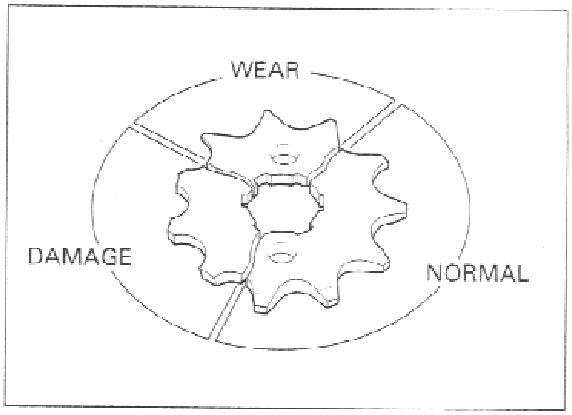


Lubricate the drive chain with #80 – 90 gear oil or Pro Honda chain lube designed specifically for use with O-ring chains. Wipe off any excess oil or chain lubricant.



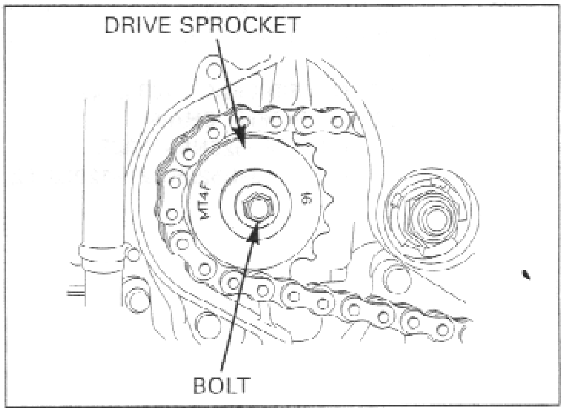
SPROCKETS INSPECTION

Inspect the drive and driven sprocket teeth for wear or damage, replace if necessary.
Never use a new drive chain on worn sprockets.
Both chain and sprockets must be in good condition, or the new replacement chain will wear rapidly.



Check the attaching bolts and nuts on the drive and driven sprockets.
If any are loose, torque them.

TORQUE:
Drive sprocket bolt: 54 N·m (5.5 kgf·m, 40 lbf·ft)
Driven sprocket nut: 64 N·m (6.5 kgf·m, 47 lbf·ft)

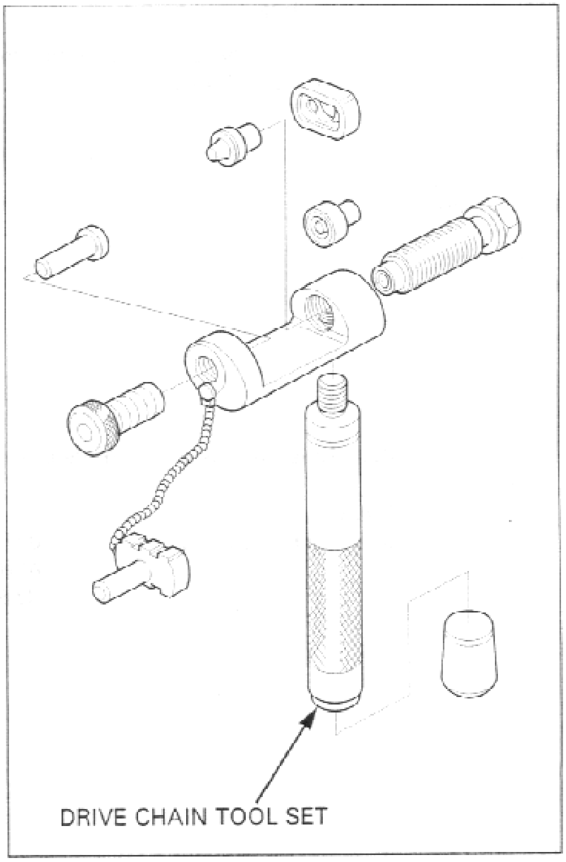


REPLACEMENT

This motorcycle uses a drive chain with a staked master link.
Loosen the drive chain (page 3-19).
Assemble the special tool as shown.

When using the special tool, follow the manufacturer's instruction.

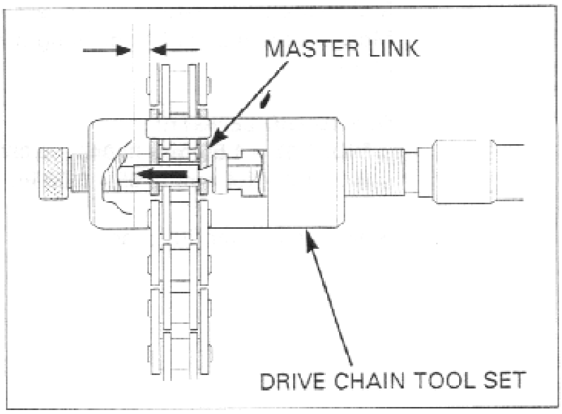
TOOL:
Drive chain tool set **07HMH–MR10103 or 07HMH–MR1010A (U.S.A. only)**



Locate the crimped pin ends of the master link from the outside of the chain, and remove the link with the drive chain tool set.

TOOL:
Drive chain tool set **07HMH–MR10103 or 07HMH–MR1010A (U.S.A. only)**

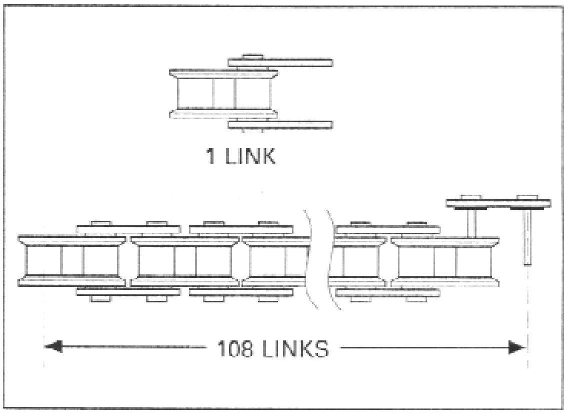
Remove the drive chain.



Include the master link when you count the drive chain links.

Remove the excess drive chain links from the new drive chain with the drive chain tool set.

STANDARD LINKS: 108 links
REPLACEMENT CHAIN:
DID: DID525HV-120ZB
RK: RKGB525ROZ1-120LJ-FZ

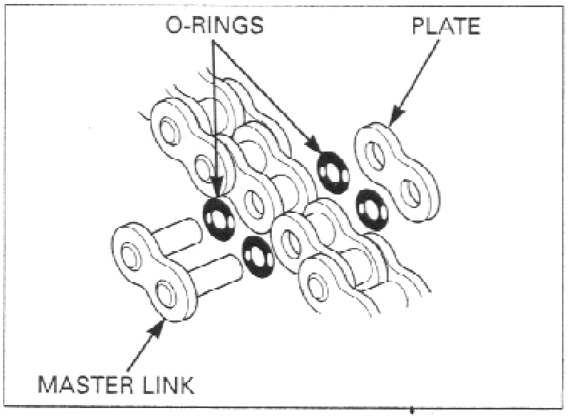


NOTICE

Never reuse the old drive chain, master link, master link plate and O-rings.

Insert the master link from the inside of the drive chain, and install the plate with the identification mark facing out.

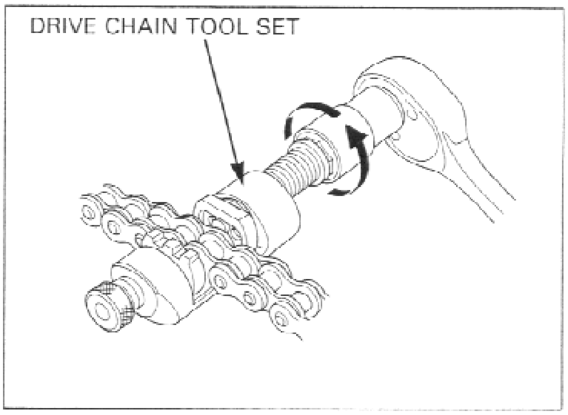
Assemble the new master link, O-rings and plate.



Assemble and install the drive chain tool set.

TOOL:

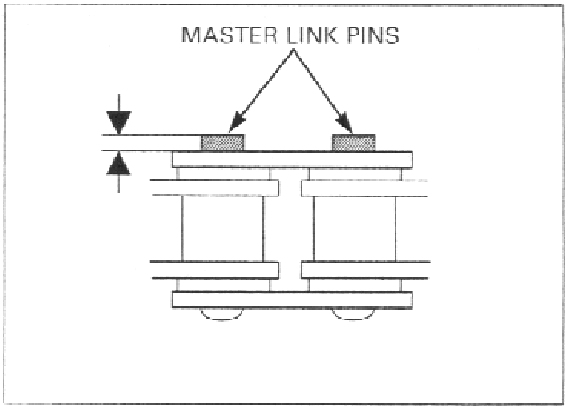
Drive chain tool set	**07HMH-MR10103 or 07HMH-MR1010A (U.S.A. only)**



Make sure the master link pins are installed properly. Measure the master link pin length projected from the plate.

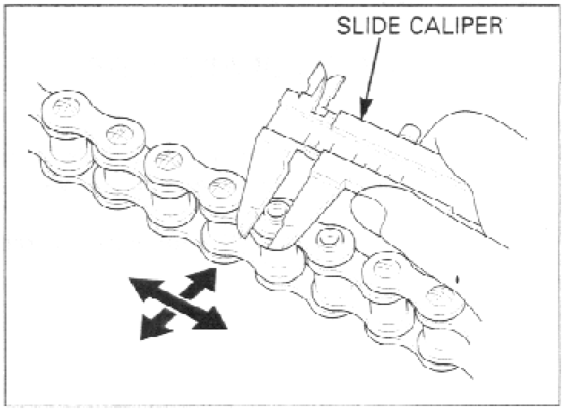
STANDARD LENGTH:
DID: 1.15 – 1.55 mm (0.045 – 0.061 in)
RK: 1.2 – 1.4 mm (0.05 – 0.06 in)

Stake the master link pins.



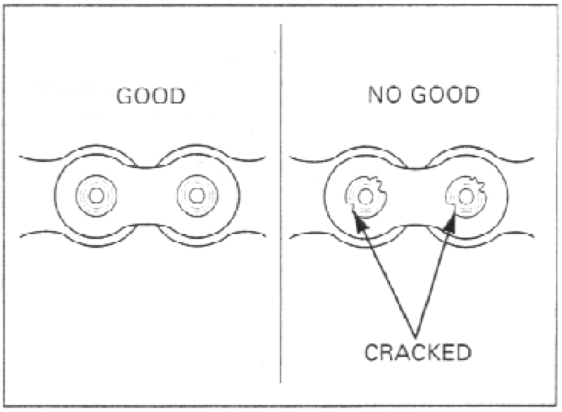
Make sure the pins are staked properly by measuring the diameter of the staked area using a slide caliper.

DIAMETER OF THE STAKED AREA:
DID: 5.50 – 5.80 mm (0.217 – 0.228 in)
RK: 5.55 – 5.85 mm (0.219 – 0.230 in)



A drive chain with a clip-type master link must not be used.

After staking, check the staked area of the master link for cracks.
If there is any cracking, replace the master link, O-rings and plate.

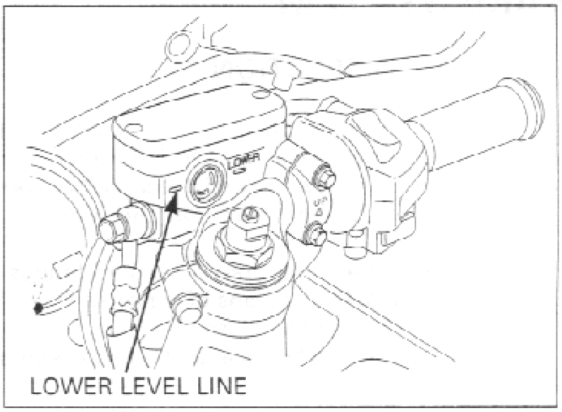


BRAKE FLUID

NOTICE

- *Do not mix different types of fluid, as they are not compatible with each other.*
- *Do not allow foreign material to enter the system when filling the reservoir.*
- *Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.*

When the fluid level is low, check the brake pads for wear (see next page). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper piston is pushed out, and this accounts for a low reservoir level. If the brake pads are not worn and the fluid level is low, check the entire system for leaks (see next page).

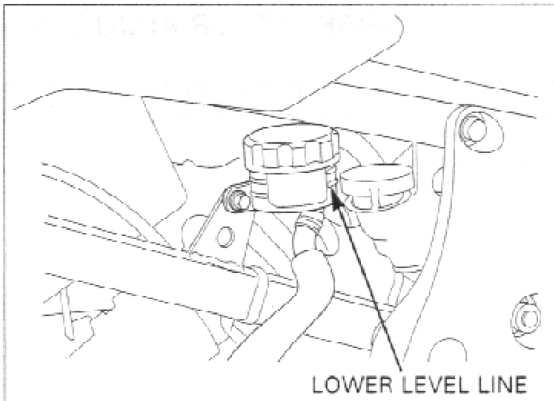


FRONT BRAKE

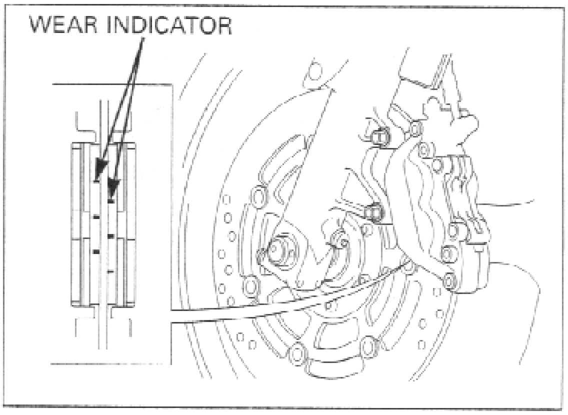
Turn the handlebar so the reservoir is level and check the front brake fluid reservoir level.
If the level is near the lower level line, check brake pad wear (see next page).

REAR BRAKE

Place the motorcycle on a level surface and support it in an upright position.
Check the rear brake fluid reservoir level.
If the level is near the lower level line, check brake pad wear (see next page).



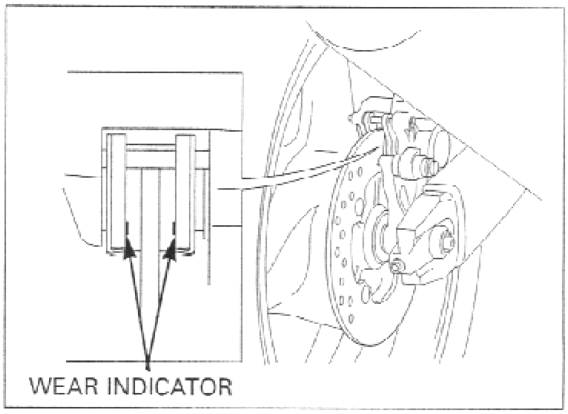
BRAKE PAD WEAR



FRONT BRAKE PADS

Check the brake pad for wear.
Replace the brake pads if either pad is worn to the bottom of the wear limit groove.

Refer to page 15-7 for brake pad replacement.

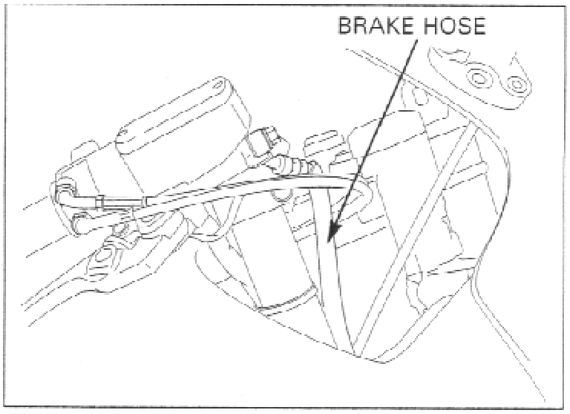


REAR BRAKE PADS

Check the brake pads for wear.
Replace the brake pads if either pad is worn to the bottom of the wear limit groove.

Refer to page 15-8 for brake pad replacement.

BRAKE SYSTEM



INSPECTION

Firmly apply the brake lever or pedal, and check that no air has entered the system.
If the lever or pedal feels soft or spongy when operated, bleed the air from the system.

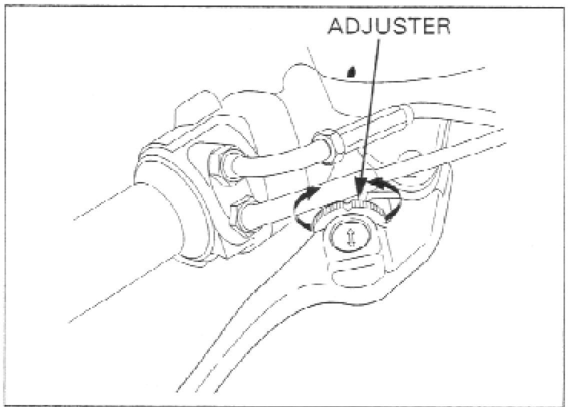
Inspect the brake hose and fittings for deterioration, cracks and signs of leakage.
Tighten any loose fittings.
Replace hoses and fittings as required.

Refer to page 15-5 for brake bleeding procedures.

BRAKE LEVER ADJUSTMENT

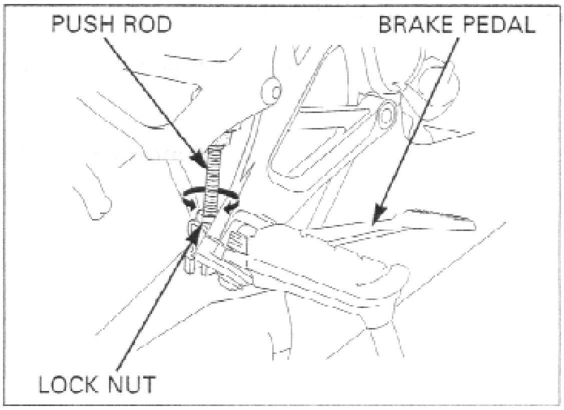
Align the mark on the brake lever with the index number on the adjuster.

The distance between the top of the brake lever and the grip can be adjusted by turning the adjuster.



BRAKE PEDAL HEIGHT ADJUSTMENT

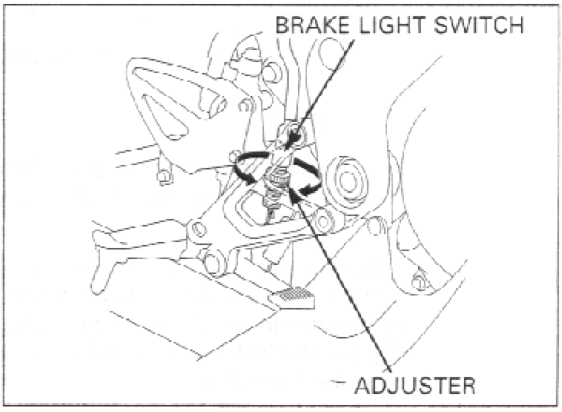
Loosen the lock nut and turn the push rod until the correct pedal height is obtained.



BRAKE LIGHT SWITCH

The front brake light switch does not require adjustment.

Adjust the brake light switch so the brake light comes on just prior to the brake actually being engaged.
If the light fails to come on, adjust the switch so the light comes on at the proper time.
Hold the switch body and turn the adjuster. Do not turn the switch body.

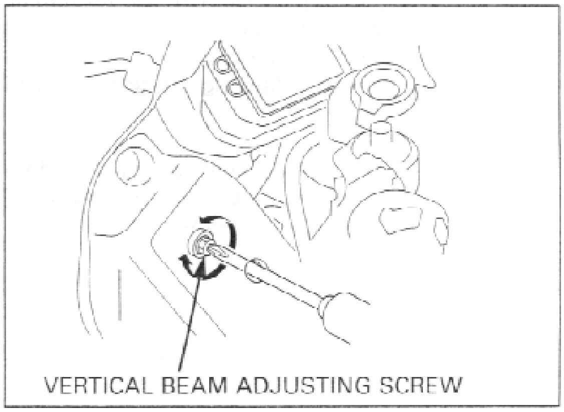


HEADLIGHT AIM

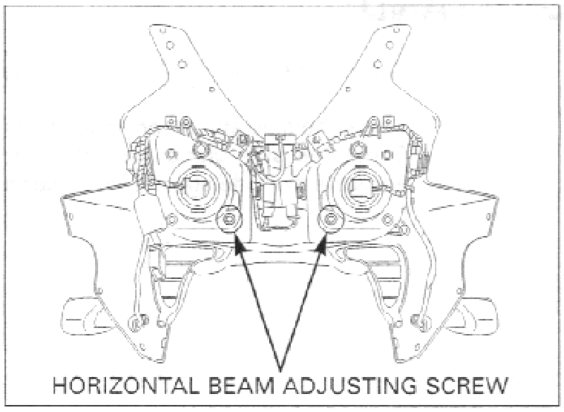
Adjust the headlight beam as specified by local laws and regulations.

Place the motorcycle on a level surface.

Adjust the headlight beam vertically by turning the vertical beam adjuster.
A clockwise rotation moves the beam up and counterclockwise rotation moves the beam down.



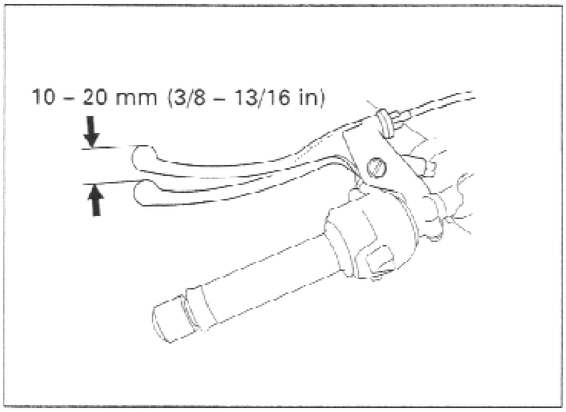
Adjust the headlight beam horizontally by turning the horizontal beam adjuster
A clockwise rotation moves the beam toward the right side of the rider.



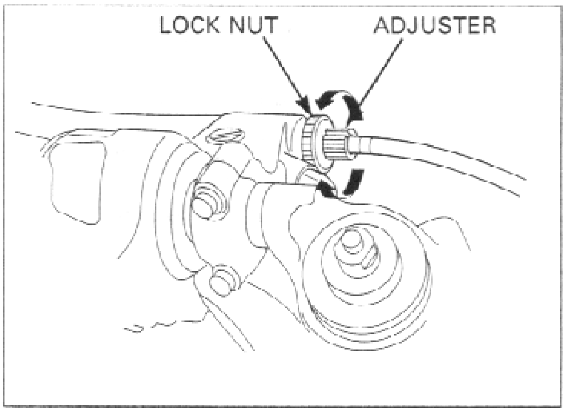
CLUTCH SYSTEM

Measure the clutch lever free play at the end of the clutch lever.

FREE PLAY: 10 – 20 mm (3/8 – 13/16 in)



Minor adjustments are made using the upper adjuster at the clutch lever.
Loosen the lock nut and turn the adjuster.



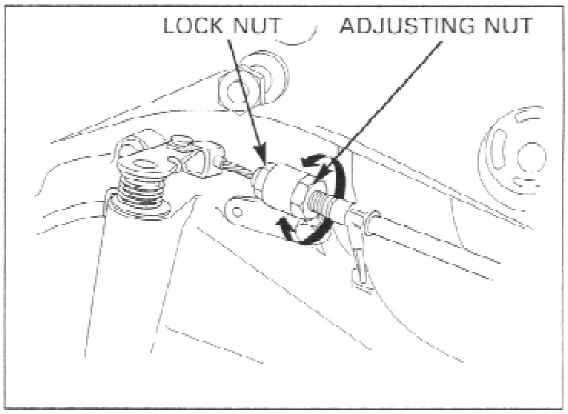
NOTICE

The adjuster may be damaged if it is positioned too far out, leaving minimal thread engagement.

If the adjuster is threaded out near its limit and the correct free play cannot be obtained, turn the adjuster all the way in and back out one turn.
Tighten the lock nut and make a major adjustment as described as follow.

Major adjustments are performed at the clutch arm.
Loosen the lock nut and turn the adjusting nut to adjust the free play.
Hold the adjusting nut securely while tightening the lock nut.

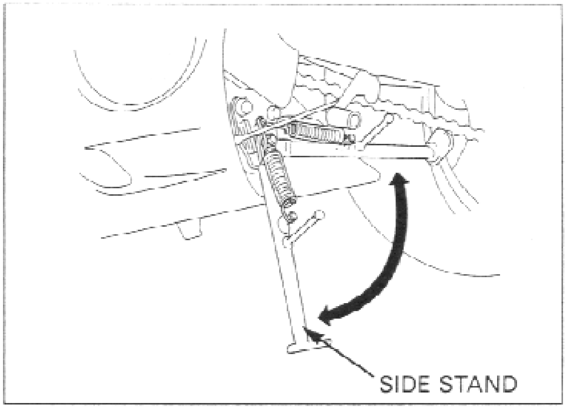
If proper free play cannot be obtained, or the clutch slips during test ride, disassemble and inspect the clutch (see section 9).



SIDE STAND

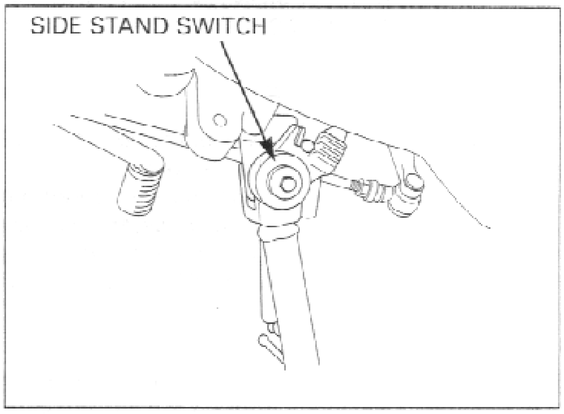
Support the motorcycle on a level surface.

Check the side stand spring for fatigue or damage.
Check the side stand assembly for movement and lubricate the side stand pivot if necessary.



Check the side stand ignition cut-off system:
- Sit astride the motorcycle and raise the side stand.
- Start the engine with the transmission in neutral, then shift the transmission into gear, with the clutch lever squeezed.
- Lower the side stand fully.
- The engine should stop as the side stand is lowered.

If there is a problem with the system, check the side stand switch (section 19).



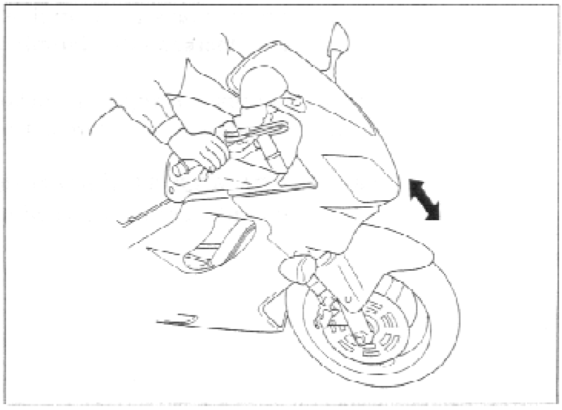
SUSPENSION

FRONT SUSPENSION INSPECTION

Check the action of the forks by operating the front brakes and compressing the front suspension several times.
Check the entire assembly for signs of leaks, damage or loose fasteners.

Loose, worn or damaged suspension parts impair motorcycle stability and control.

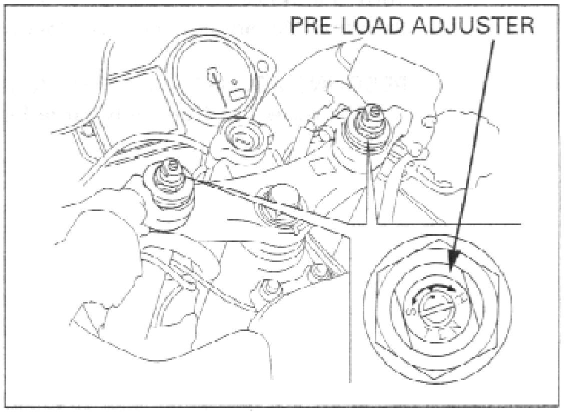
Replace damaged components which cannot be repaired.
Tighten all nuts and bolts.
Refer to section 13 for fork service.



FRONT SUSPENSION ADJUSTMENT

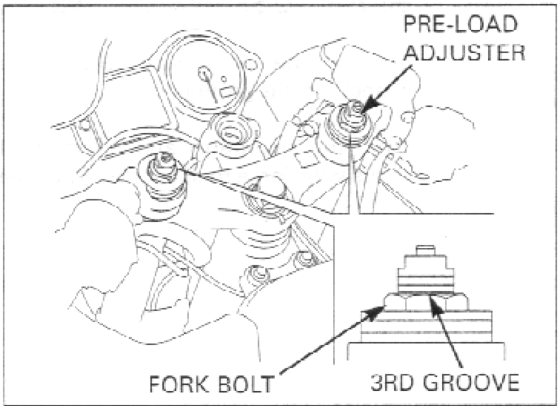
SPRING PRE-LOAD ADJUSTER
Spring pre-load can be adjusted by turning the adjuster.

TURN CLOCKWISE:
Increase the spring pre-load
TURN COUNTERCLOCKWISE:
Decrease the spring pre-load

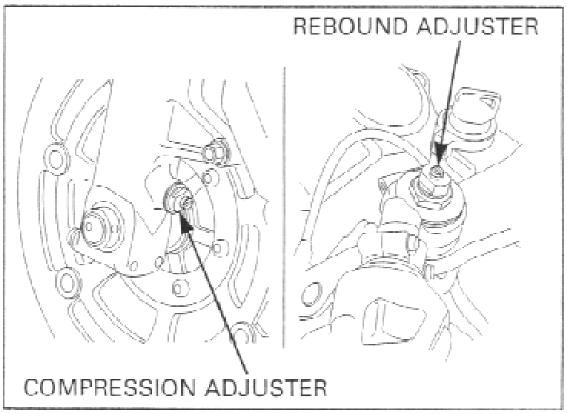


PRE-LOAD ADJUSTER ADJUSTABLE RANGE:
6 – 21 mm (0.2 – 0.8 in) from the top of the fork bolt

PRE-LOAD ADJUSTER STANDARD POSITION:
4th groove from the top of the fork bolt



COMPRESSION AND REBOUND DAMPING ADJUSTERS



NOTICE

- *Always start with the adjusters fully turned in when adjusting the damping.*
- *Do not turn the adjuster screws more than the given positions or the adjusters may be damaged.*
- *Make sure he rebound and compression adjusters are firmly located in a detent, and not between positions.*

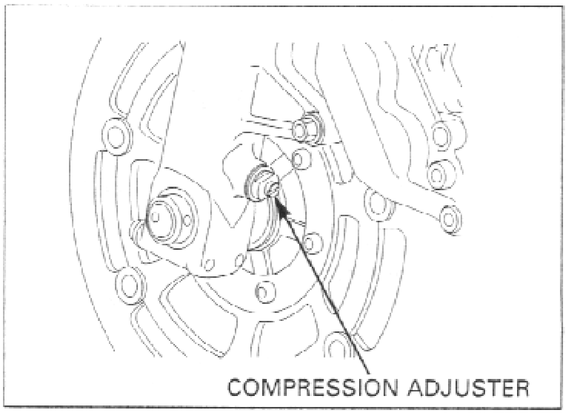
To adjust both sides equally, set the right and left damping adjusters to the same position.

The compression and rebound damping can be adjusted by turning the adjusters.

DIRECTION H: Increase the damping force
DIRECTION S: Decrease the damping force

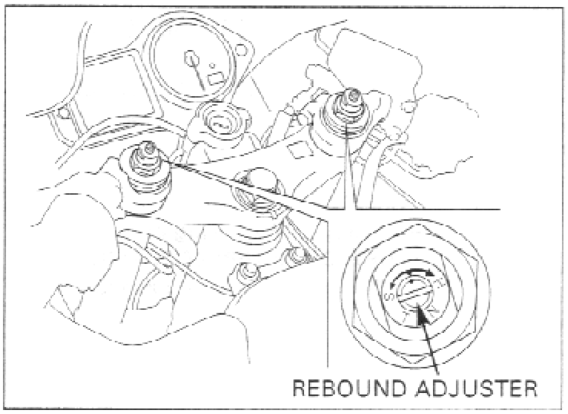
Turn the compression adjuster clockwise until it stops, then turn the adjuster counterclockwise.

COMPRESSION ADJUSTER STANDARD POSITION:
1-1/4 turns out from fully turned in



Turn the rebound adjuster clockwise until it stops, then turn the adjuster counterclockwise.

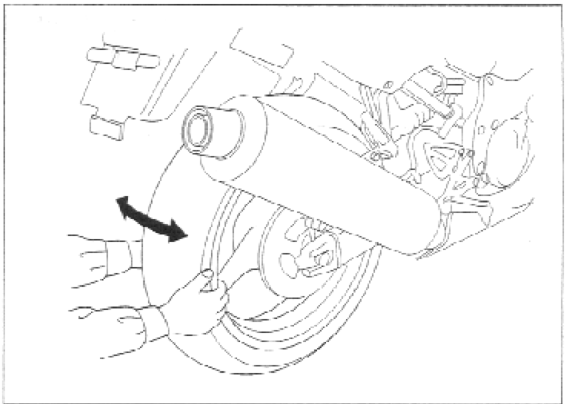
REBOUND ADJUSTER STANDARD POSITION:
1-3/4 turns out from fully turned in



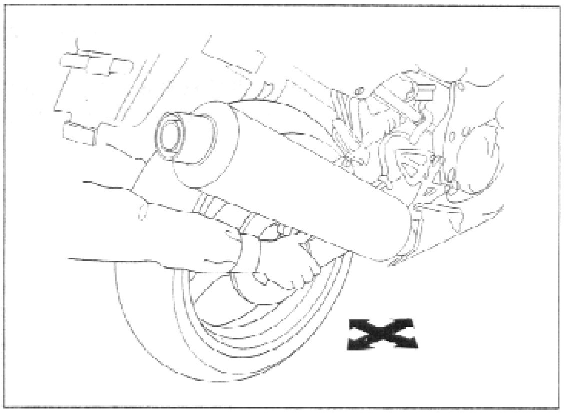
REAR SUSPENSION INSPECTION

Support the motorcycle securely and raise the rear wheel off the ground.

Hold the swingarm and move the rear wheel sideways with force to see if the wheel bearings are worn.

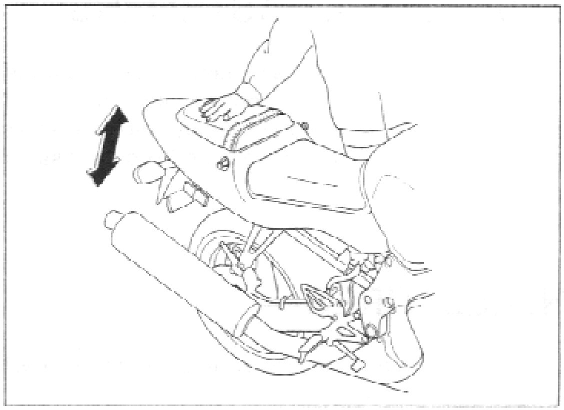


Check for worn swingarm bearings by grabbing the rear swingarm and attempting to move the swingarm side to side.
Replace the bearings if any looseness is noted.



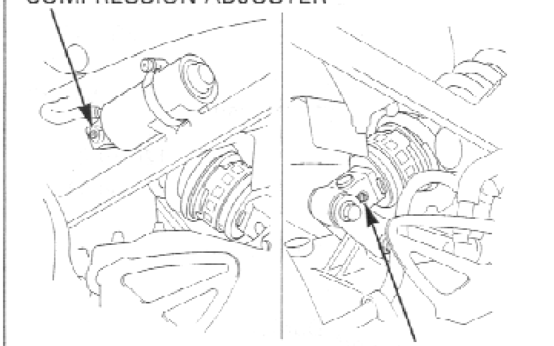
Check the action of the shock absorber by compressing it several times.
Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.
Replace damaged components which cannot be repaired.
Tighten all nuts and bolts.

Refer to section 14 for shock absorber service.



REAR SUSPENSION ADJUSTMENT

COMPRESSION AND REBOUND DAMPING ADJUSTERS



NOTICE

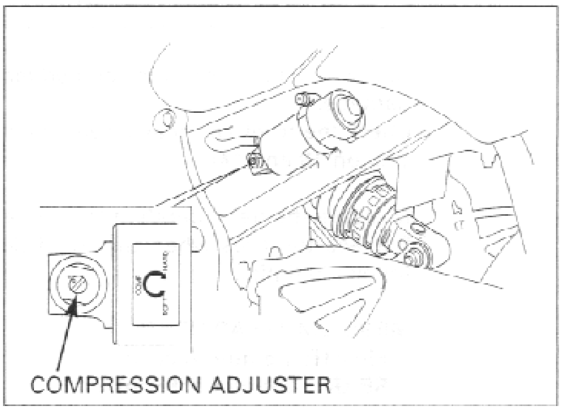
- *Always start with the adjusters fully turned in when adjusting the damping.*
- *Do not turn the adjuster screws more than the given positions or the adjusters may be damaged.*

The compression and rebound damping can be adjusted by turning the adjusters.

DIRECTION H: Increase the damping force
DIRECTION S: Decrease the damping force

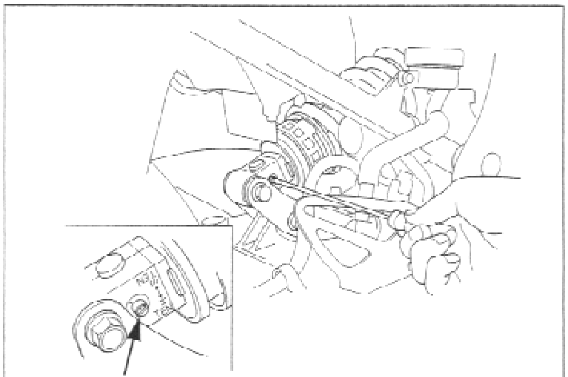
Turn the compression adjuster clockwise until it stops, then turn the adjuster counterclockwise.

COMPRESSION ADJUSTER STANDARD POSITION:
1-1/2 turns out from fully turned in



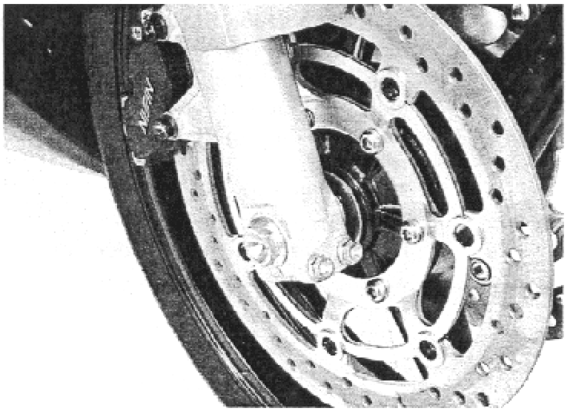
Turn the rebound adjuster clockwise until it stops, then turn the adjuster counterclockwise.

REBOUND ADJUSTER STANDARD POSITION:
1-1/2 turns out from fully turned in



NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to their correct torque values (page 1-12).
Check that all safety clips, hose clamps and cable stays are in place and properly secured.

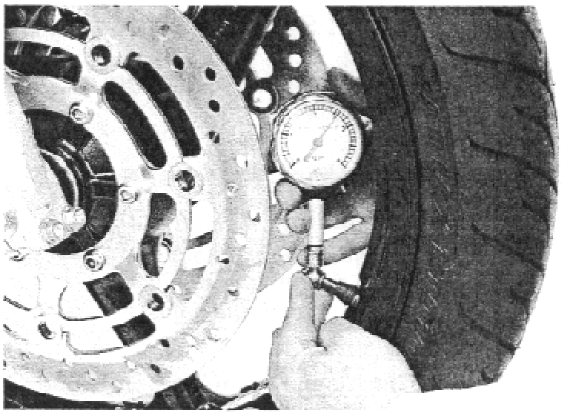


WHEELS/TIRES

Tire pressure should be checked when the tires are cold.

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

		FRONT	REAR
Tire pressure kPa (kgf/cm², psi)		250 (2.50, 36)	290 (2.90, 42)
Tire size		120/70 ZR 17 (58W)	180/55 ZR 17 (73W)
Tire brand	Bridgestone	BT101FF	BT101RF
	Dunlop	D207FJ	D207P
	Michelin	Pilot SPORT E	Pilot SPORT E

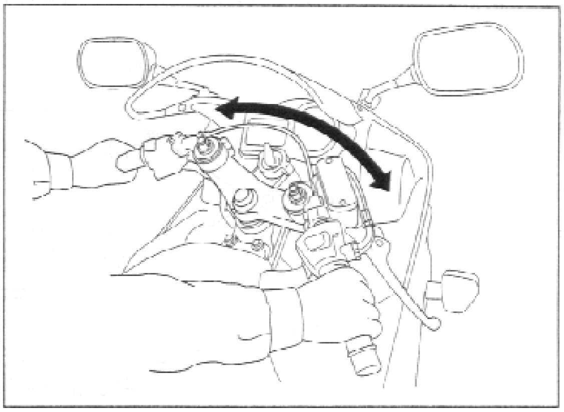


Check the tires for cuts, embedded nails, or other damage.
Check the front and rear wheels for trueness (refer to section 13 and 14).

Measure the tread depth at the center of the tires.
Replace the tires when the tread depth reaches the following limits.

MINIMUM TREAD DEPTH:
FRONT: 1.5 mm (0.06 in)
REAR: 2.0 mm (0.08 in)

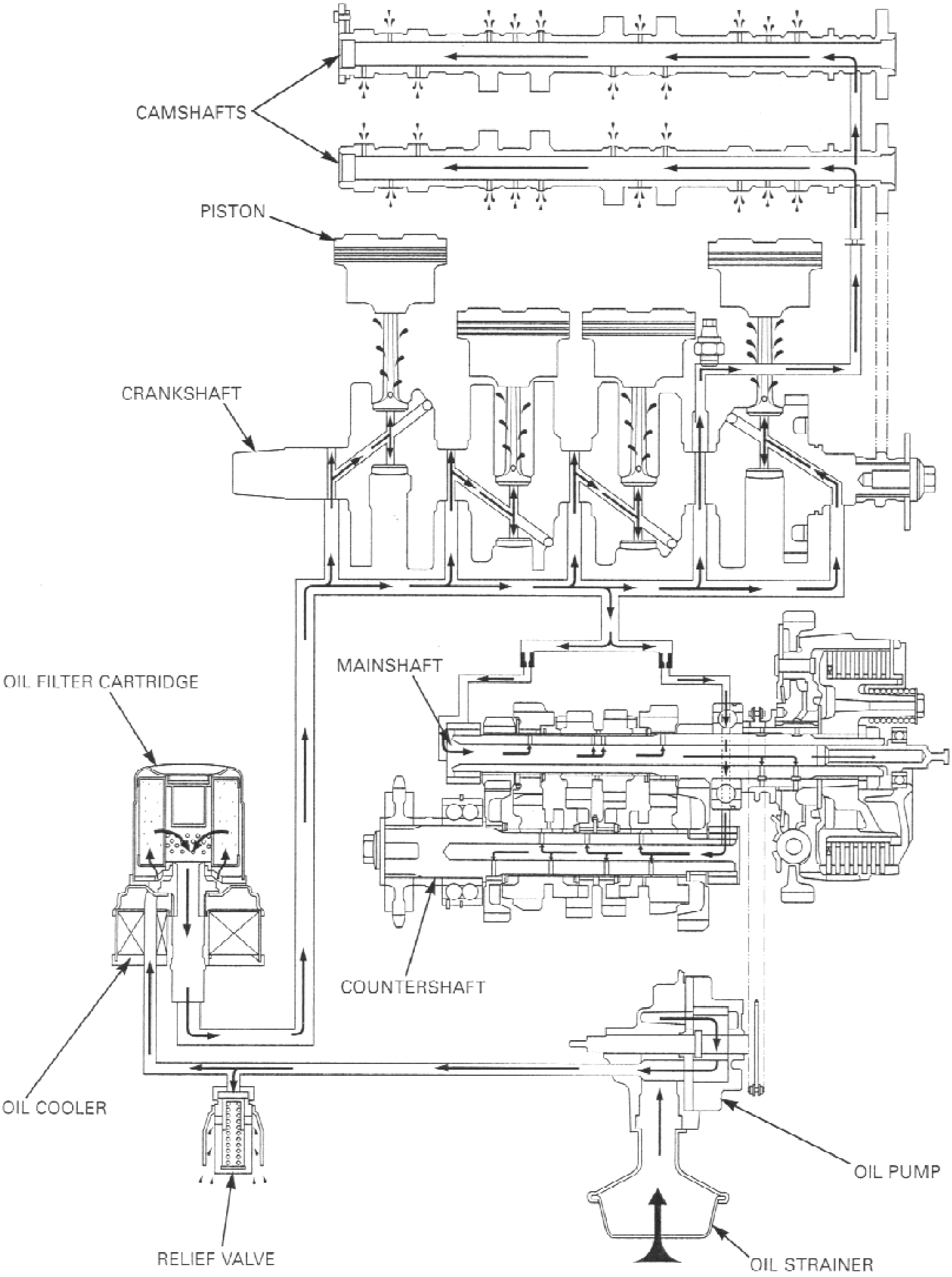
STEERING HEAD BEARINGS



Check that the control cables do not interfere with handlebar rotation.

Support the motorcycle securely and raise the front wheel off the ground.
Check that the handlebar moves freely from side to side.
If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (Section 13).

LUBRICATION SYSTEM DIAGRAM



4. LUBRICATION SYSTEM

SERVICE INFORMATION

GENERAL

⚠ CAUTION

Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

- The oil pump can be serviced with the engine installed in the frame.
- The service procedures in this section must be performed with the engine oil drained.
- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- After the oil pump has been installed, check that there are no oil leaks and that oil pressure is correct.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Engine oil capacity	After draining	3.0 liter (3.2 US qt, 2.6 Imp qt)	—
	After draining/filter change	3.3 liter (3.5 US qt, 2.9 Imp qt)	—
	After disassembly	3.7 liter (3.9 US qt, 3.3 Imp qt)	—
Recommended engine oil		Pro HONDA GN4 or HP4 4-stroke oil (U.S.A. and Canada) or Honda 4-stroke oil (Canada only), or equivalent motor oil API service classification SF or SG Viscosity: SAE 10W–40	—
Oil pressure at oil pressure switch		490 kPa (5.0 kgf/cm², 71 psi) at 6,000 rpm (80°C/176°F)	—
Oil pump rotor	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15 – 0.22 (0.006 – 0.009)	0.35 (0.014)
	Side clearance	0.02 – 0.07 (0.001 – 0.003)	0.10 (0.004)

TORQUE VALUES

Oil main gallery sealing bolt	29 N•m (3.0 kgf•m, 22 lbf•ft)	Apply a locking agent to the threads.
Oil pressure switch	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply sealant to the threads.
Oil pressure switch wire terminal bolt/washer	2 N•m (0.2 kgf•m, 1.4 lbf•ft)	
Oil pump cover bolt	8 N•m (0.8 kgf•m, 5.8 lbf•ft)	CT bolt.
Oil cooler bolt (filter boss)	64 N•m (6.5 kgf•m, 47 lbf•ft)	Apply oil to the threads and flange surface.
Engine oil filter cartridge	26 N•m (2.7 kgf•m, 20 lbf•ft)	Apply oil to the threads and flange surface and O-ring.
Engine oil drain bolt	29 N•m (3.0 kgf•m, 22 lbf•ft)	
Oil pump driven sprocket bolt/washer	15 N•m (1.5 kgf•m, 11 lbf•ft)	Apply a locking agent to the threads.

TOOLS

Oil pressure gauge set	07506–3000000	Equivalent commercially available in U.S.A.
Oil pressure gauge attachment	07510–MJ10100	Equivalent commercially available in U.S.A.
Oil filter wrench	07HAA–PJ70100	

TROUBLESHOOTING

Oil level too low
- Oil consumption
- External oil leak
- Worn piston rings
- Improperly installed piston rings
- Worn cylinders
- Worn stem seals
- Worn valve guide

Low oil pressure
- Oil level low
- Clogged oil strainer
- Faulty oil pump
- Internal oil leak
- Incorrect oil being used

No oil pressure
- Oil level too low
- Oil pressure relief valve stuck open
- Broken oil pump drive chain
- Broken oil pump drive or driven sprocket
- Damaged oil pump
- Internal oil leak

High oil pressure
- Oil pressure relief valve stuck closed
- Clogged oil filter, gallery or metering orifice
- Incorrect oil being used

Oil contamination
- Oil or filter not changed often enough
- Worn piston rings

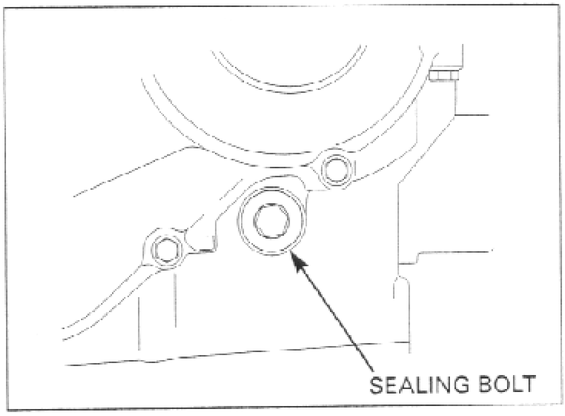
Oil emulsification
- Blown cylinder head gasket
- Leaky coolant passage
- Entry of water

OIL PRESSURE INSPECTION

If the oil pressure indicator light remains on a few seconds, check the indicator system before checking the oil pressure.

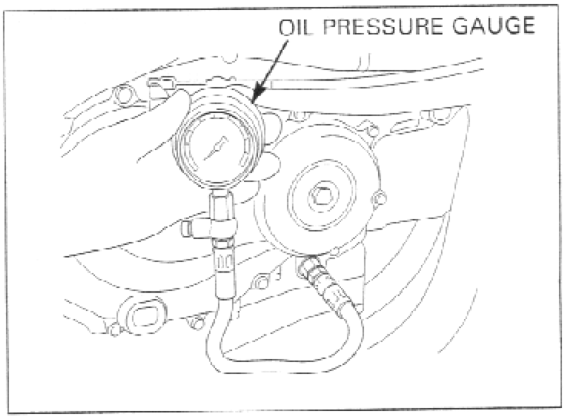
Check the oil level (page 3-14).

Warm up the engine to normal operating temperature (approximately 80°C/176°F).
Stop the engine and remove the oil main gallery sealing bolt.



Connect an oil pressure gauge and attachment to the main gallery.

TOOLS:
Oil pressure gauge set **07506–3000000**
(equivalent commercially available in U.S.A.)
Oil pressure gauge attachment
07510–MJ10100
(equivalent commercially available in U.S.A.)



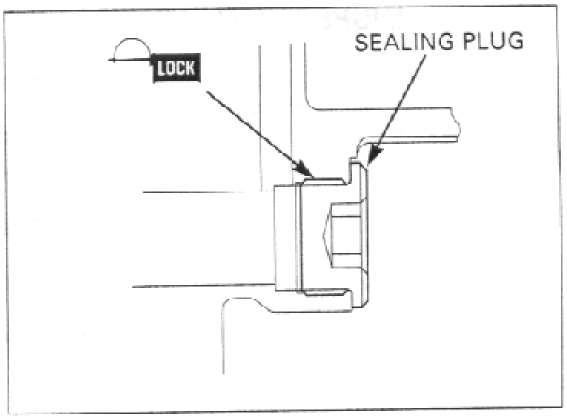
Start the engine and increase engine speed to 6,000 rpm and read the oil pressure.

OIL PRESSURE:
490 kPa (5.0 kgf/cm², 71 psi) at 6,000 rpm/ (80°C/176°F)

Stop the engine and remove the tools.

Apply a locking agent to the sealing plug threads.
Install and tighten the sealing plug to the specified torque.

TORQUE: 29 N•m (3.0 kgf•m, 22 lbf•ft)

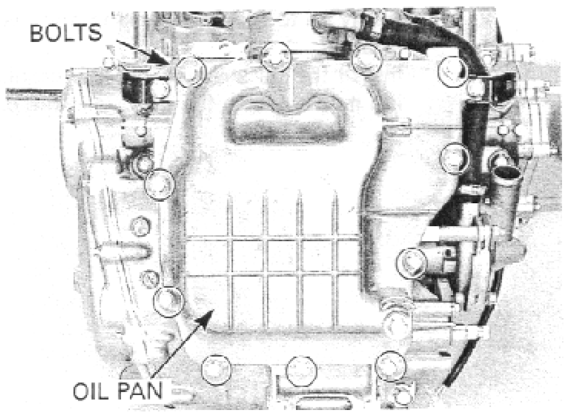


OIL STRAINER/PRESSURE RELIEF VALVE

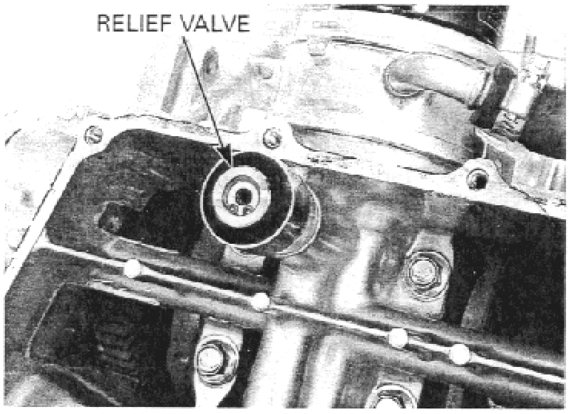
REMOVAL

Drain the engine oil (page 3-15).
Remove the exhaust pipe (page 2-19)

Remove the oil pan flange bolts and oil pan.

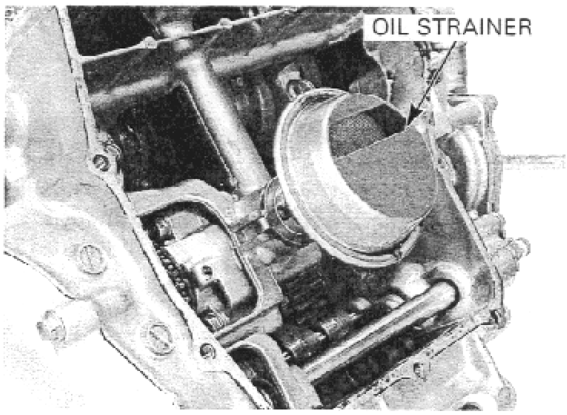


Remove the pressure relief valve and O-ring.



Remove the oil strainer and packing.

Clean the oil strainer screen.

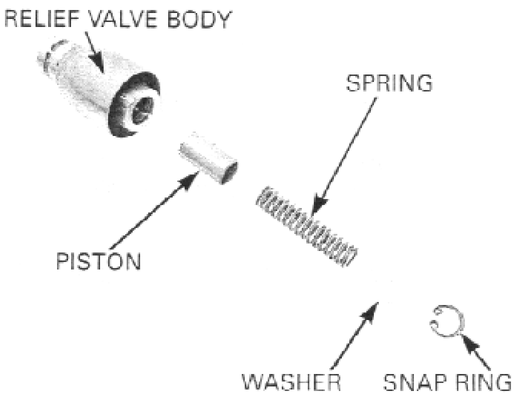


INSPECTION

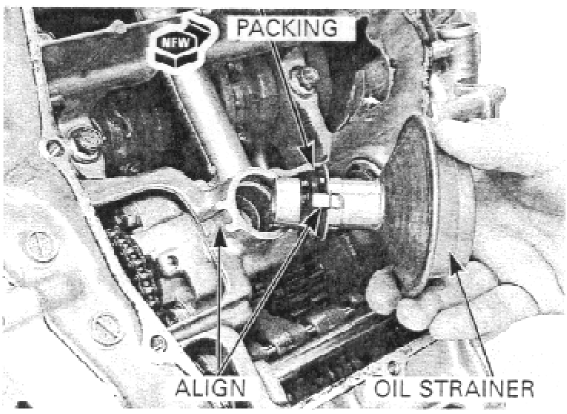
Check the operation of the pressure relief valve by pushing on the piston.
Disassemble the relief valve by removing the snap ring.

Inspect the piston for wear, unsmooth movement or damage.
Inspect the spring for fatigue or damage.

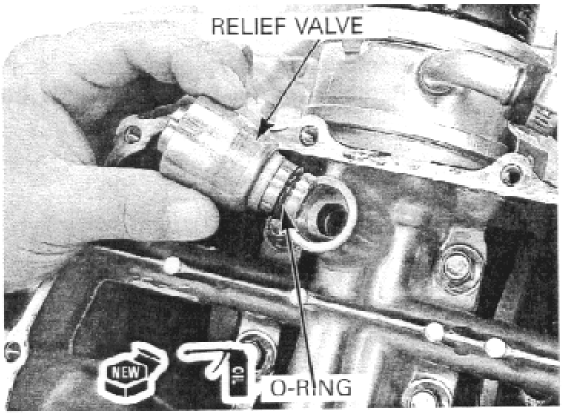
Assemble the relief valve in the reverse order of disassembly.



Apply oil to the new packing and install it onto the oil strainer.
Install the oil strainer into the crankcase while aligning its boss with the groove in the crankcase.

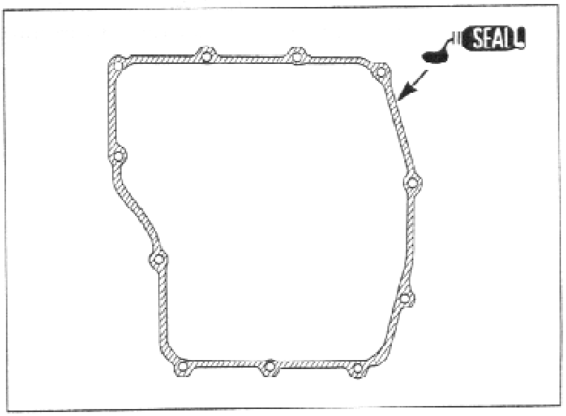


Apply oil to the new O-ring and install it onto the relief valve.
Install the relief valve into the crankcase.



Do not apply sealant more than necessary.

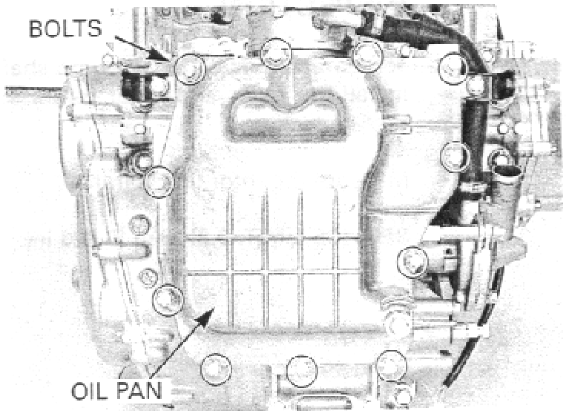
Clean the oil pan mating surface thoroughly.
Apply Three Bond 1207B or an equivalent to the mating surface.



Install the oil pan onto the lower crankcase.
Install the oil pan mounting bolts.
Tighten all of the bolts in a crisscross pattern in two to three steps.

Install the exhaust pipe (page 2-20).
Fill the crankcase with the recommended oil (page 3-14).

After installation, check that there are no oil leaks.

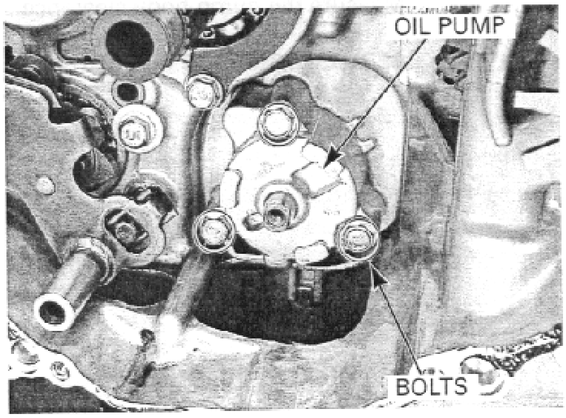


OIL PUMP

REMOVAL

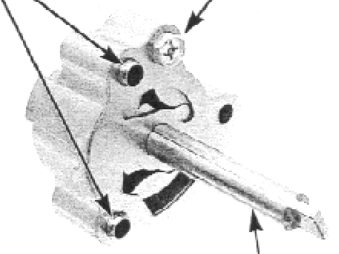
Remove the clutch and oil pump driven sprocket (page 9-4).

Remove the three flange bolts and oil pump assembly.

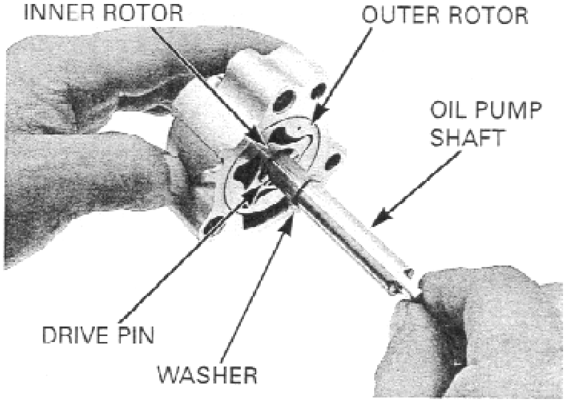


DISASSEMBLY

Remove the dowel pins.
Remove the oil pump assembly bolt and oil pump cover.



Remove the thrust washer, drive pin, oil pump shaft, outer rotor and inner rotor from the oil pump body.



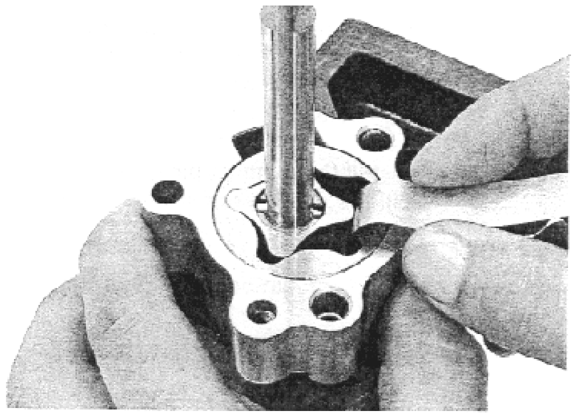
INSPECTION

If any portion of the oil pump is worn beyond the service limit, replace the oil pump as an assembly.

Temporarily install the oil pump shaft.
Install the outer and inner rotors into the oil pump body.

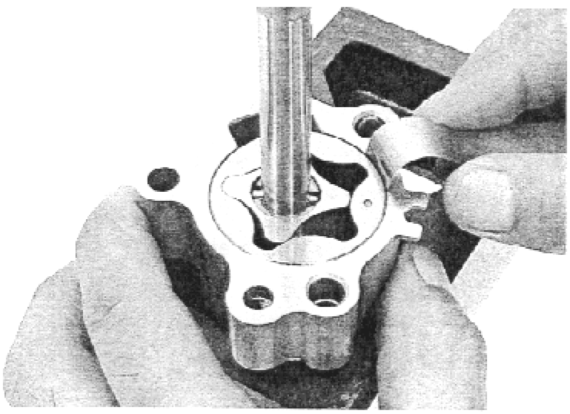
Measure the rotor tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)



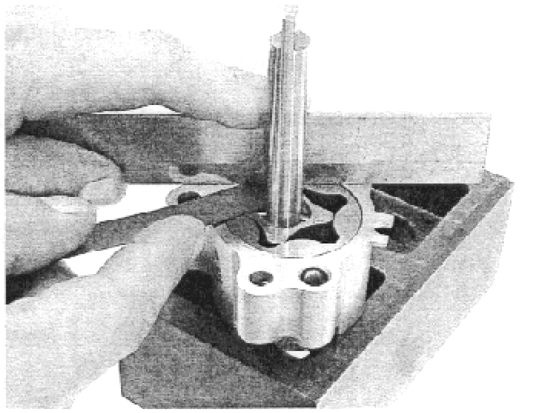
Measure the pump body clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)

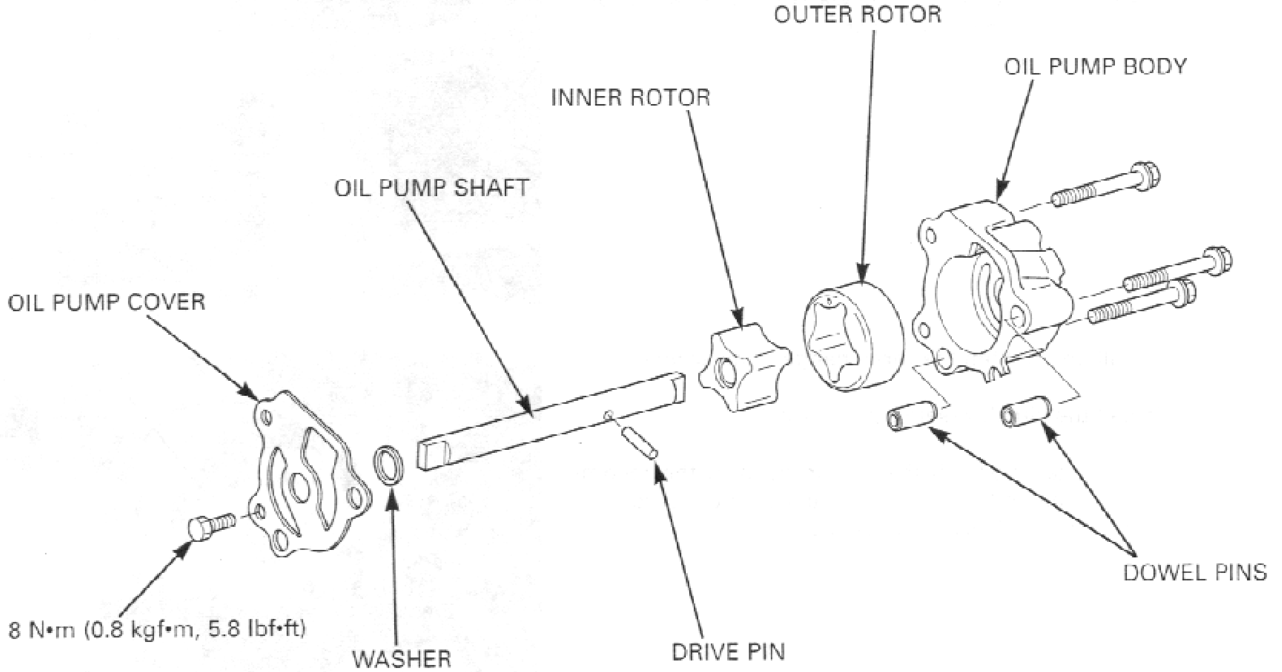


Measure the side clearance using a straight edge and feeler gauge.

SERVICE LIMIT: 0.10 mm (0.004 in)



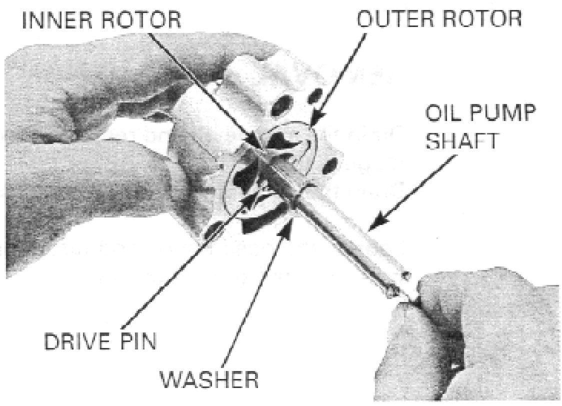
ASSEMBLY



Install the outer rotor with its punch mark facing the oil pump cover.

Install the outer rotor into the oil pump body with its punch mark facing the oil pump cover.
Install the inner rotor into the outer rotor with its drive pin groove facing the oil pump cover.
Install the oil pump shaft through the inner rotor and oil pump body.

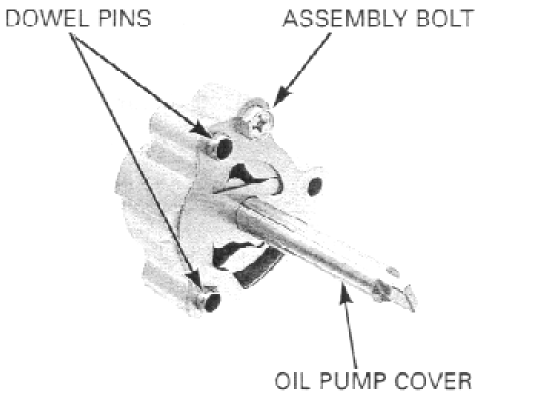
Install the drive pin into the hole in the pump shaft and align the pin with the groove in the inner rotor as shown.
Install the thrust washer.



Install the dowel pins.
Install the oil pump cover and tighten the bolt to the specified torque.

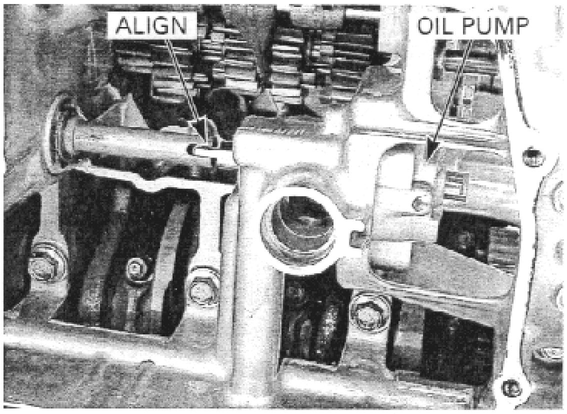
TORQUE: 8 N•m (0.8 kgf•m, 5.8 lbf•ft)

Check the oil pump operation by turning the pump shaft.
If necessary, reassemble the oil pump.



INSTALLATION

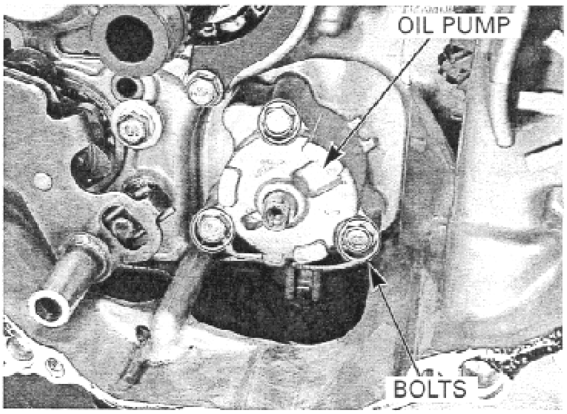
Install the oil pump onto the crankcase while aligning the pump shaft lug with the water pump shaft groove by turning the oil pump shaft.



Install and tighten the three flange bolts securely.

Install the clutch assembly (page 9-9)

After installation, fill the crankcase with the recommended oil and check that there are no oil leaks.
Check the oil pressure (page 4-3).

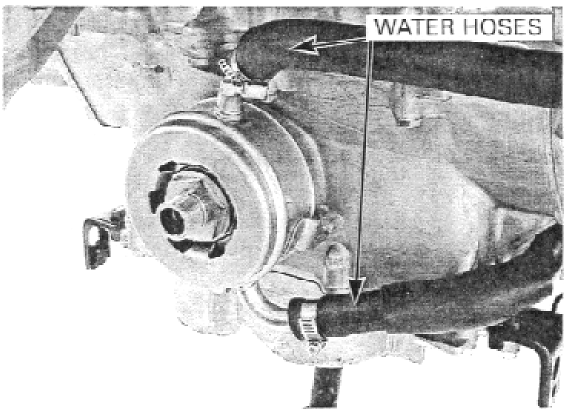


OIL COOLER

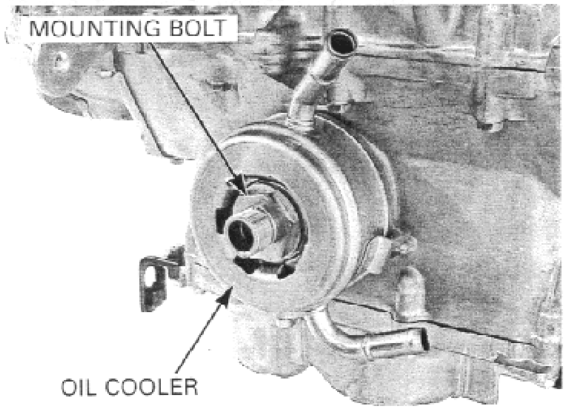
REMOVAL

Drain the engine oil and remove the oil filter cartridge (page 3-15).
Drain the coolant from the system (page 6-4).

Loosen the hose bands and disconnect the oil cooler water hoses from the cooler.



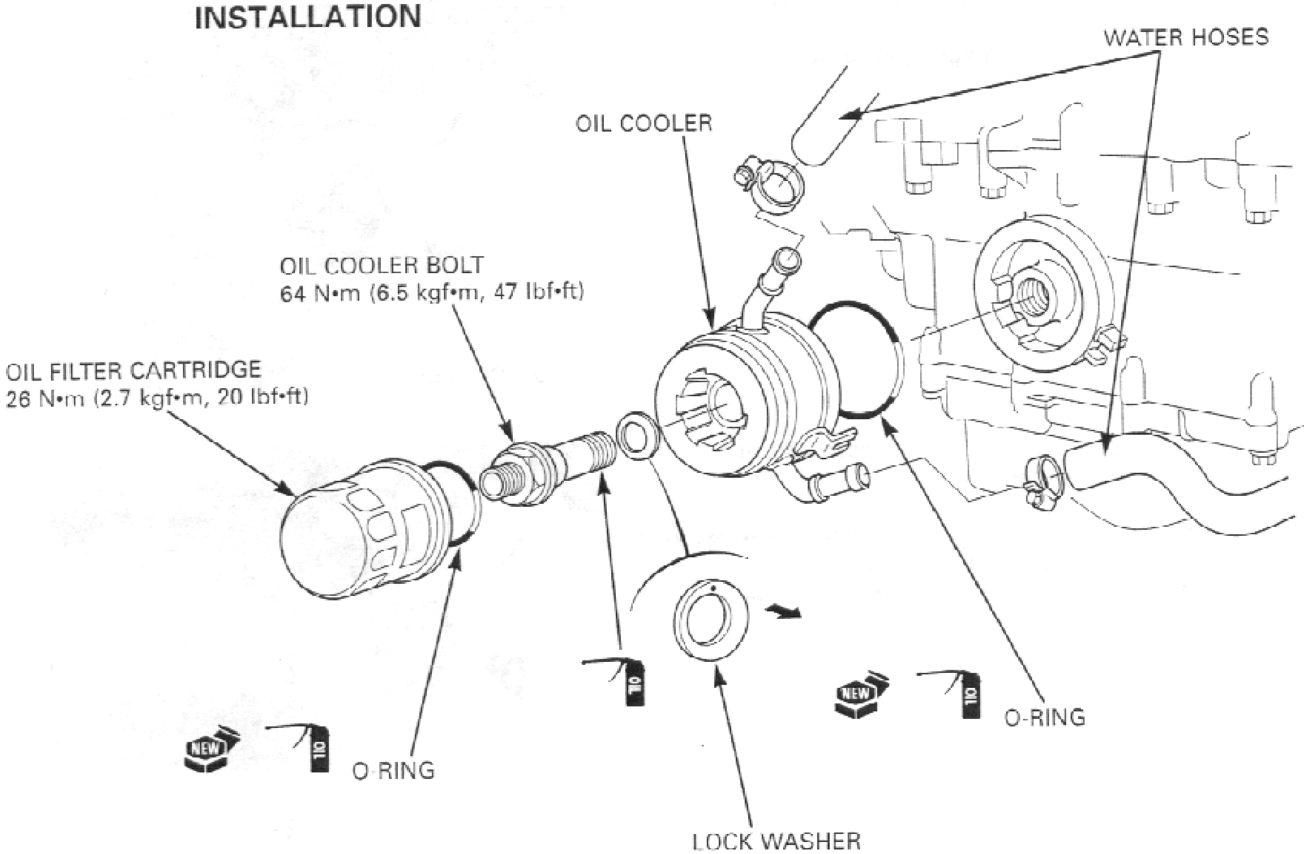
Remove the oil cooler bolt (filter boss), washer and oil cooler.
Remove the O-ring from the oil cooler.



INSPECTION

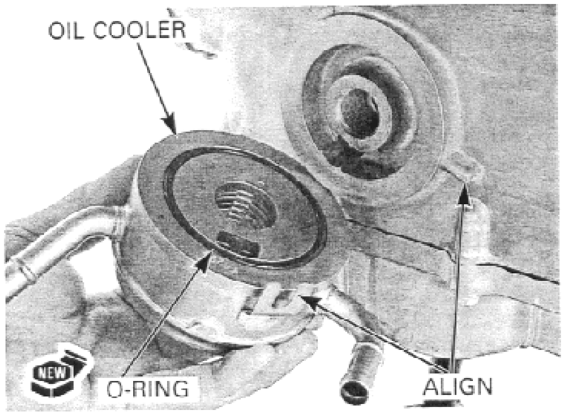
Check the oil cooler for damage.

INSTALLATION



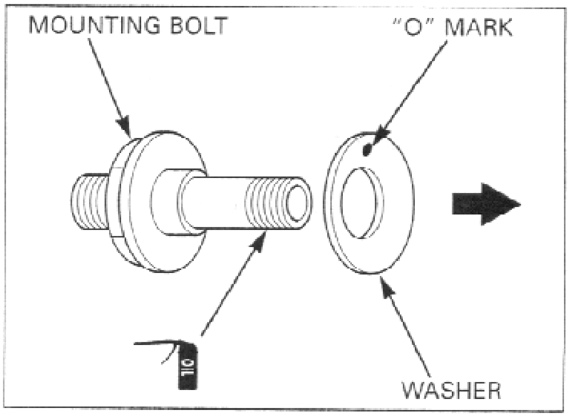
Coat a new O-ring with engine oil and install it into the oil cooler groove.

Install the oil cooler aligning its guide groove with the lug on the crankcase.



Install the lock washer with its concave side ("o" mark) facing the oil cooler.

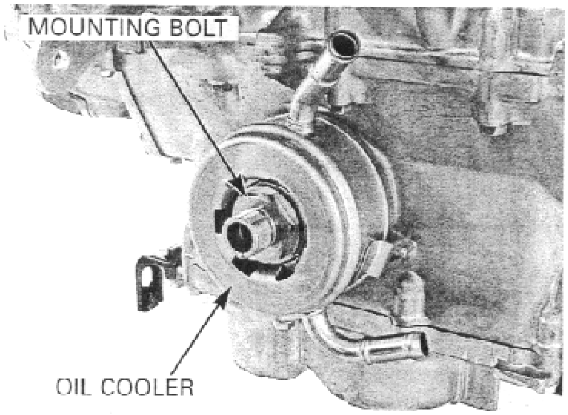
Apply oil to the oil cooler bolt threads and seating surface.
Install the lock washer and oil cooler bolt.



Make sure the oil cooler bolt collar slides inside the oil cooler.

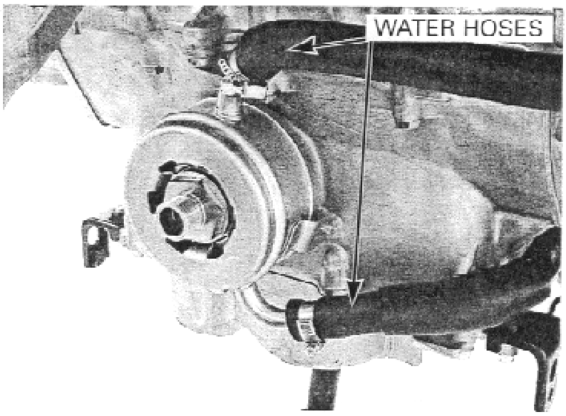
Tighten the oil cooler bolt to the specified torque.

TORQUE: 64 N•m (6.5 kgf•m, 47 lbf•ft)

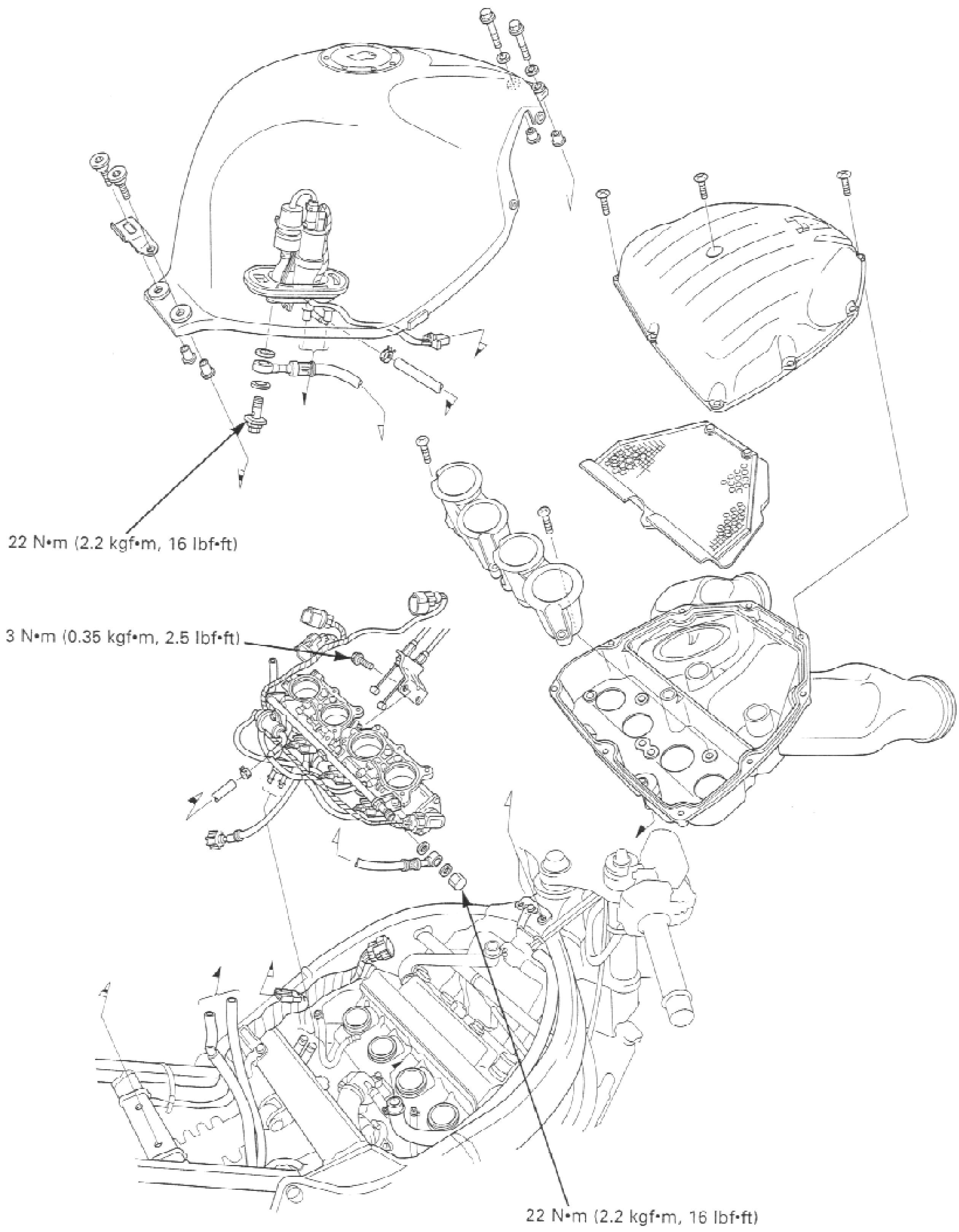


Connect the oil cooler water hoses and tighten the hose bands securely.

Install the oil filter cartridge and fill the crankcase with the recommended oil (page 3-14).
Fill the cooling system and bleed any air (page 6-4).



MEMO


22 N•m (2.2 kgf•m, 16 lbf•ft)
3 N•m (0.35 kgf•m, 2.5 lbf•ft)
22 N•m (2.2 kgf•m, 16 lbf•ft)

5. FUEL SYSTEM (Programmed Fuel Injection)

SERVICE INFORMATION

GENERAL

- Be sure to relieve the fuel pressure with the engine off.
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

- Do not apply commercially available carburetor cleaners to the inside of the throttle bore, which is coated with molybdenum.
- Do not snap the throttle valve from fully open to fully close after the throttle cable has been removed; it may cause incorrect idle operation.
- Seal the cylinder head intake ports with tape or a clean cloth to keep dirt and debris from entering the intake ports after the throttle body has been removed.
- Do not apply excessive force to the fuel pipe on the throttle body while removing or installing the throttle body.
- Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.
- Prevent dirt and debris from entering the throttle bore, fuel hose and return hose, clean them using compressed air.
- The throttle body is factory pre-set. Do not disassemble in a way other than shown in this manual.
- Do not loosen or tighten the white painted bolts and screws of the throttle body. Loosening or tightening them can cause throttle and idle valve synchronization failure.
- Do not push the fuel pump base under the fuel tank when the fuel tank is stored.
- Always replace the packing when the fuel pump is removed.
- The programmed fuel injection system is equipped with the Self-Diagnostic System described on page 5-6. If the malfunction indicator lamp (MIL) blinks, follow the Self-Diagnostic Procedures to remedy the problem.
- When checking the PGM-FI, always follow the steps in the troubleshooting flow chart (page 5-10).
- The PGM-FI system is provided with fail-safe function to secure a minimum running capability even when there is trouble in the system. When any abnormality is detected by the self-diagnosis function, running capability is secured by making use of the numerical values of a situation preset in advance in the simulated program map. It must be remembered, however, that when any abnormality is detected in four injectors and/or the ignition and cam pulse generator, the fail safe function stops the engine to avoid engine damage.
- For PGM-FI system location, see page 5-4.
- A faulty PGM-FI system is often related to poorly connected or corroded connectors. Check those connections before proceeding.
- For fuel reserve sensor inspection, see section 19.
- The vehicle speed sensor sends digital pulse signals to the ECM (PGM-FI unit) for computation. For vehicle speed sensor inspection, see section 19.
- When disassembling the programmed fuel injection parts, note the location of the O-rings. Replace them with new ones upon reassembly.
- Before disconnecting the fuel hoses, release the fuel pressure by loosening the fuel hose banjo bolt at the fuel tank.
- Always replace the sealing washers when the fuel hose banjo bolt is removed or loosened.
- Use a digital tester for PGM-FI system inspection.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Throttle body identification number	Except California type	GO90C
	California type	GO90B
Starter valve vacuum difference		20 mm Hg
Base throttle valve for synchronization		No.1
Idle speed		1,300 ± 100 rpm
Throttle grip free play		2 – 6 mm (1/16 – 1/4 in)
Intake air temperature sensor resistance (at 20°C/68°F)		1 – 4 kΩ
Engine coolant temperature sensor resistance (at 20°C/68°F)		2.3 – 2.6 kΩ
Fuel injector resistance (at 20°C/68°F)		11.1 – 12.3 Ω
PAIR solenoid valve resistance (at 20°C/68°F)		20 – 24 Ω
Cam pulse generator peak voltage (at 20°C/68°F)		0.7 V minimum
Ignition pulse generator peak voltage (at 20°C/68°F)		0.7 V minimum
Manifold absolute pressure at idle		150 – 250 mm Hg
Fuel pressure at idle		343 kPa (3.5 kgf/cm², 50 psi)
Fuel pump flow (at 12 V)		188 cm³ (6.4 US oz, 6.6 Imp oz) minimum/10 seconds

TORQUE VALUES

ECT/thermo sensor	23 N•m (2.3 kgf•m, 17 lbf•ft)	
Throttle body insulator band screw	See page 1-14.	
Throttle cable bracket mounting screw	3 N•m (0.35 kgf•m, 2.5 lbf•ft)	
Starter valve synchronization plate screw	1 N•m (0.09 kgf•m, 0.7 lbf•ft)	
Starter valve lock nut	2 N•m (0.18 kgf•m, 1.3 lbf•ft)	
Fast idle wax unit link plate screw	1 N•m (0.09 kgf•m, 0.7 lbf•ft)	
Fast idle wax unit mounting screw	5 N•m (0.5 kgf•m, 3.6 lbf•ft)	
Pressure regulator mounting bolt	10 N•m (1.0 kgf•m, 7 lbf•ft)	
Vacuum joint for synchronization	3 N•m (0.3 kgf•m, 2.2 lbf•ft)	
Fuel filler cap bolt	2 N•m (0.2 kgf•m, 1.4 lbf•ft)	
Service check bolt	15 N•m (1.5 kgf•m, 11 lbf•ft)	
Fuel hose banjo bolt (fuel tank side)	22 N•m (2.2 kgf•m, 16 lbf•ft)	
Fuel hose sealing nut (throttle body side)	22 N•m (2.2 kgf•m, 16 lbf•ft)	
Fuel pump mounting nut	12 N•m (1.2 kgf•m, 9 lbf•ft)	See page 5-54 for tightening sequence.
O_2 sensor (California type only)	25 N•m (2.6 kgf•m, 19 lbf•ft)	

TOOLS

Fuel pressure gauge	07406–0040003	or 07406–0040002
Peak voltage tester (U.S.A. only) or	07HGJ-0020100 (not available in U.S.A.) with	
Peak voltage adaptor	Commercially available digital multimeter (impedance 10 MΩ/DCV minimum)	
ECU test harness	07YMZ-0010100	(two required)

TROUBLESHOOTING

Engine won't start
- Intake air leak
- Fuel contaminated/deteriorated
- Pinched or clogged fuel hose
- Faulty fuel pump
- Clogged fuel filter
- Clogged fuel injector filter
- Sticking fuel injector needle
- Faulty fuel pump operating system

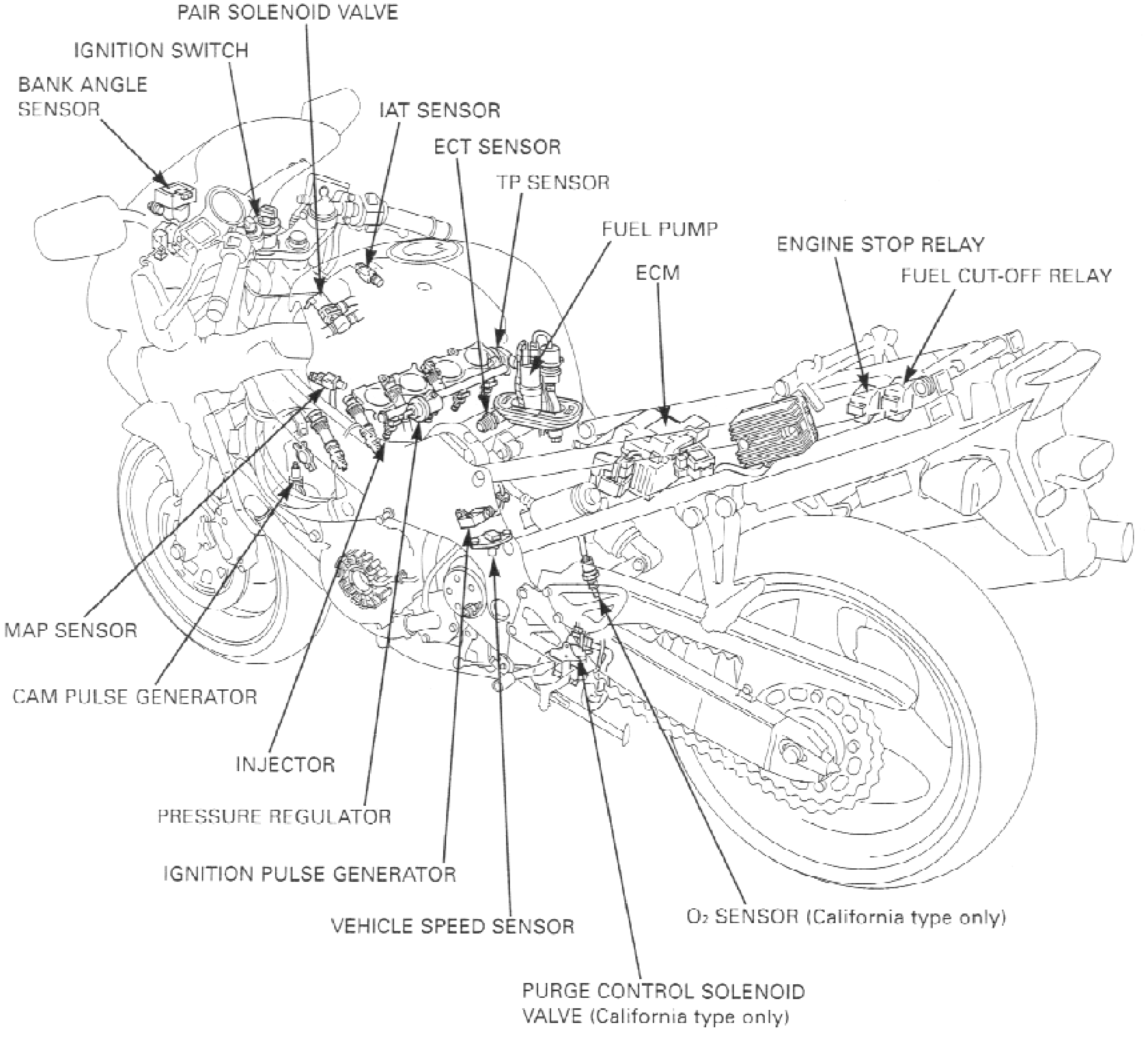
Engine stall, hard to start, rough idling
- Intake air leak
- Fuel contaminated/deteriorated
- Pinched or clogged fuel hose
- Idle speed misadjusted
- Starter valve synchronization misadjusted

Backfiring or misfiring during acceleration
- Ignition system malfunction

Poor performance (driveability) and poor fuel economy
- Pinched or clogged fuel hose
- Faulty pressure regulator

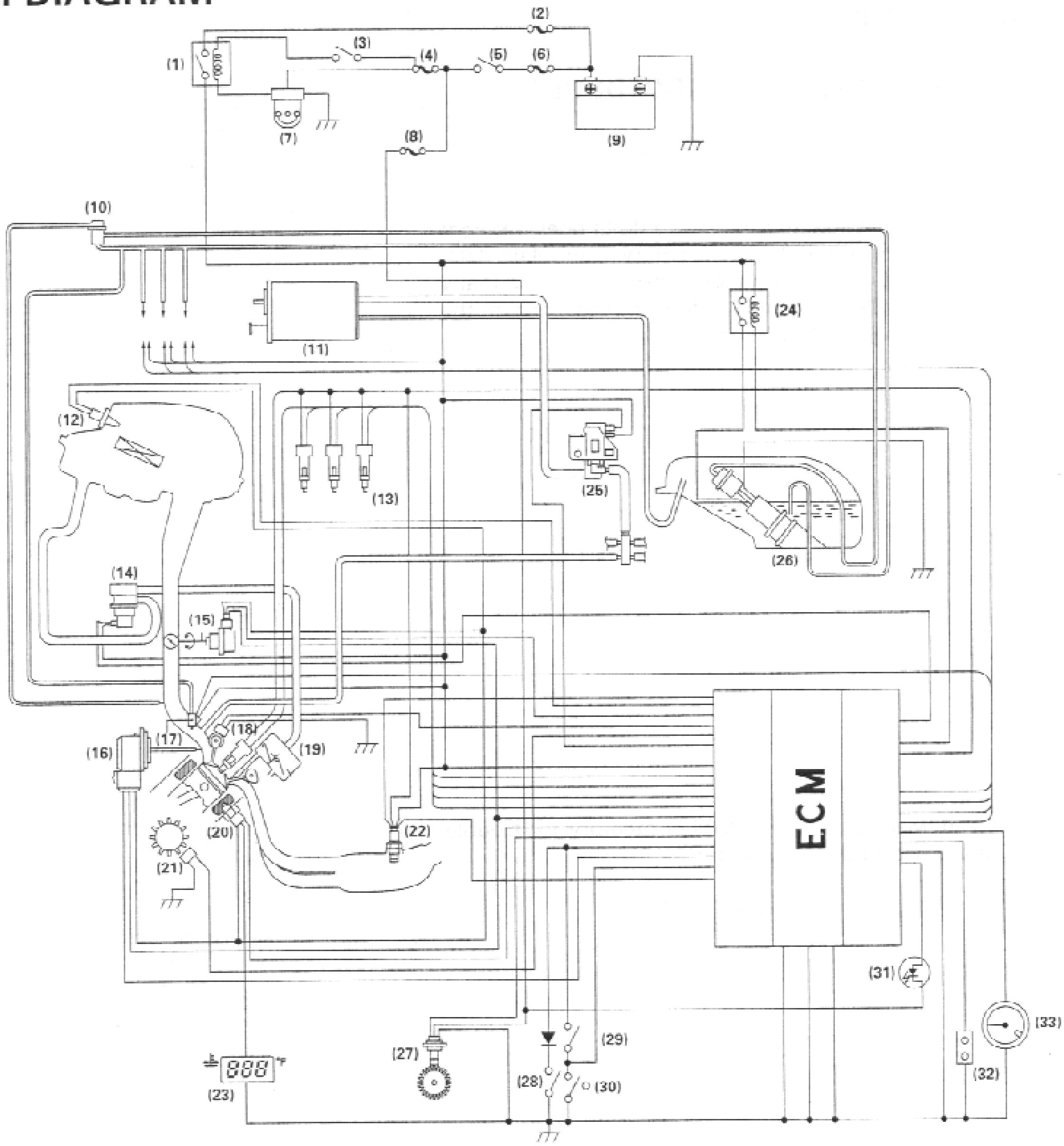
SYSTEM LOCATION

California type shown:



FULL NAME	ABBREVIATIONS
Manifold absolute pressure sensor	MAP sensor
Throttle position sensor	TP sensor
Intake air temperature sensor	IAT sensor
Engine coolant temperature sensor	ECT sensor
Engine control module	ECM

SYSTEM DIAGRAM



(1)	Engine stop relay	(18)	Cam pulse generator
(2)	PGM-FI fuse (20A)	(19)	PAIR check valve
(3)	Engine stop switch	(20)	ECT sensor
(4)	Sub-fuse (10A)	(21)	Ignition pulse generator
(5)	Ignition switch	(22)	O_2 sensor (California type only)
(6)	Main fuse A (30A)	(23)	Water temperature LCD
(7)	Bank angle sensor	(24)	Fuel cut-off relay
(8)	Sub-fuse (10A)	(25)	EVAP purge control solenoid valve (California type only)
(9)	Battery	(26)	Fuel pump
(10)	Pressure regulator	(27)	Vehicle speed sensor
(11)	EVAP canister (California type only)	(28)	Neutral switch
(12)	IAT sensor	(29)	Clutch switch
(13)	Direct ignition coil and spark plug	(30)	Side stand switch
(14)	PAIR solenoid valve	(31)	Malfunction indicator lamp (MIL)
(15)	TP sensor	(32)	Service check connector
(16)	MAP sensor	(33)	Tachometer
(17)	Injector		

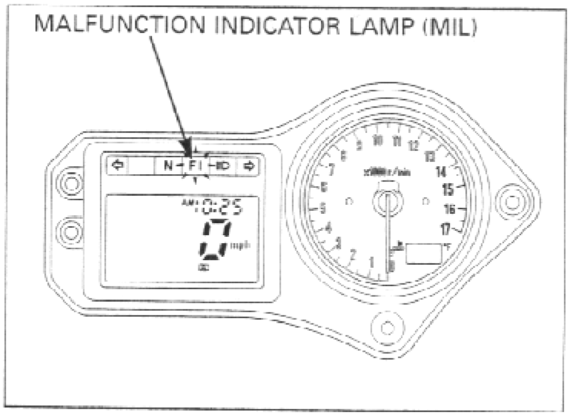
PGM-FI (PROGRAMMED FUEL INJECTION) SYSTEM

SELF-DIAGNOSTIC PROCEDURES

Place the motorcycle on its side stand.
Start the engine and let it idle.

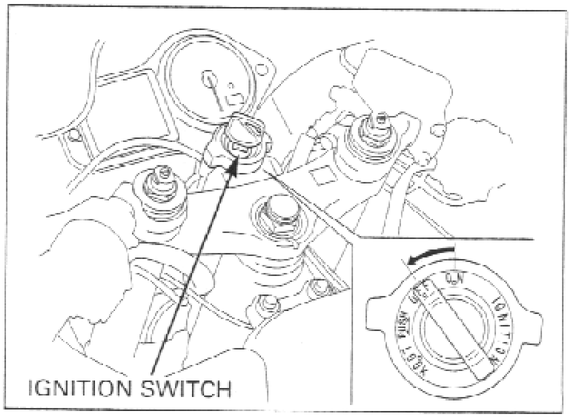
The malfunction indicator lamp (MIL) will start blinking only with the side stand down and with the engine off (engine stop switch turned to run) or engine revs are below 5,000 rpm. In any other conditions, the MIL will illuminate and stay on.

If the malfunction indicator lamp (MIL) does not light or blink, the system has no memory of problem data. If the malfunction indicator blinks, note how many times the MIL blinks, and determine the cause of the problem (page 5-10 through 5-49).



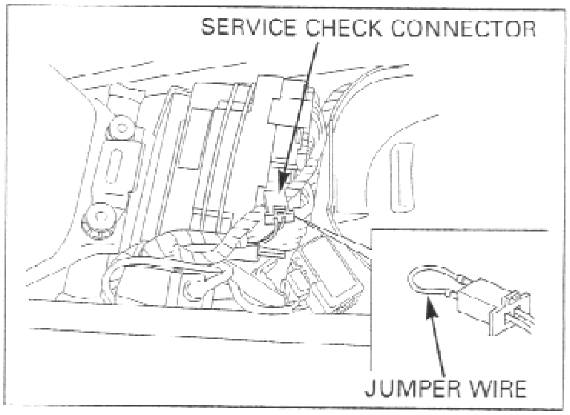
If you wish to read the PGM-FI memory for trouble data, perform the following:

Turn the ignition switch to "OFF".



Remove the seat (page 2-2).

Short the PGM-FI system service check connector terminals using a jumper wire.



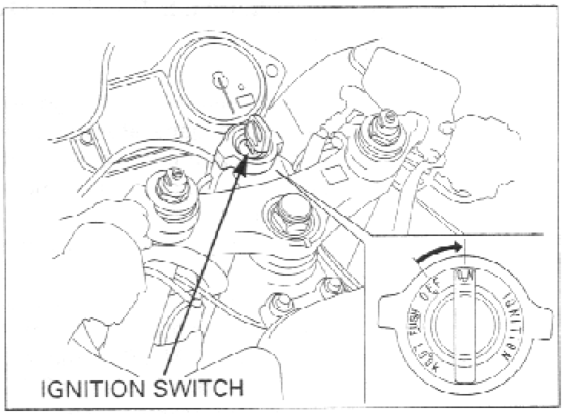
Turn the ignition switch to "ON" and the engine stop switch to "RUN".

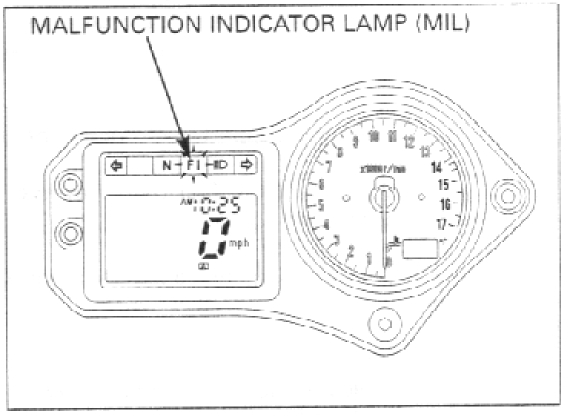
Even if the PGM-FI has memory data, the MIL does not blink when the engine is running.

If the ECM has no self diagnosis memory data, the MIL will illuminate, when you turn the ignition switch to "ON".

If the ECM has self diagnosis memory data, the MIL will start blinking when you turn the ignition switch to "ON".

Note how many times the MIL blinks, and determine the cause of the problem (page 5-10 through 5-49).



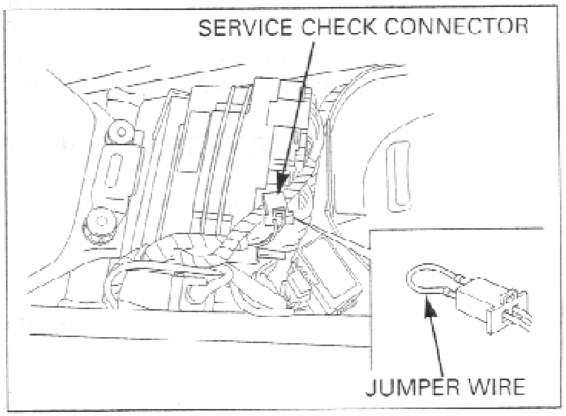


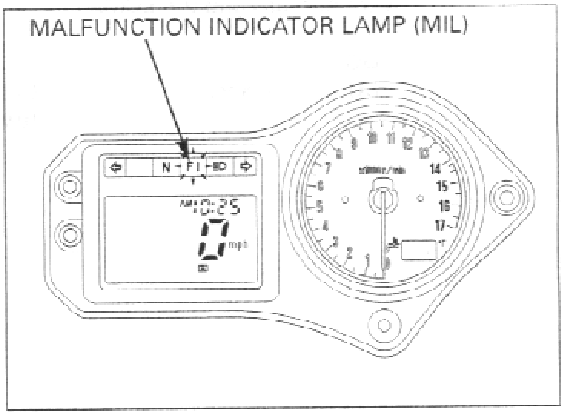
SELF-DIAGNOSIS RESET PROCEDURE

1. Turn the engine stop switch to "RUN" and the ignition switch to "OFF".
2. Short the service check connector of the PGM-FI system using a jumper wire.
3. Turn the ignition switch to "ON".
4. Remove the jumper wire from the service check connector.
5. The MIL lights about 5 seconds.
   While the indicator lights, short the service check connector again with the jumper wire.
   Self diagnosis memory data is erased if the MIL turns off and then starts blinking.

- The service check connector must be jumped while the indicator lights. If not, the MIL will not start blinking.
- Note that the self diagnosis memory data cannot be erased if you turn off the ignition switch before the MIL starts blinking.

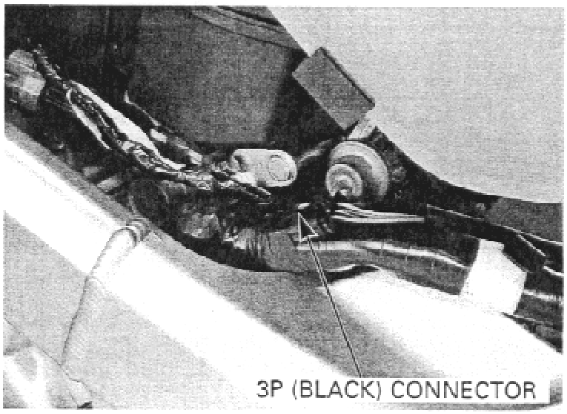
If the MIL blinks 20 times, the data has not been erased, so try again.





PEAK VOLTAGE INSPECTION PROCEDURE

- Use this procedure for the ignition pulse generator and cam pulse generator inspection.
- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that all spark plugs are installed correctly.
- Use the recommended digital multimeter or a commercially available digital multimeter with an impedance of 10 MΩ/DCV minimum.
- If the Peak Voltage Tester (U.S.A. only) is used, follow the manufacturer's instruction.
- The display value differs depending upon the internal impedance of the multimeter.
- Disconnect the fuel pump connector before checking the peak voltage.

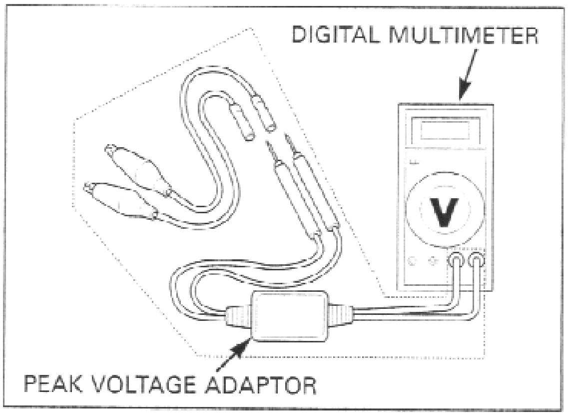


Open and support the front end of fuel tank (page 3-4).

Disconnect the fuel pump/reserve sensor 3P (Black) connector.

Avoid touching the tester probes to prevent electric shock

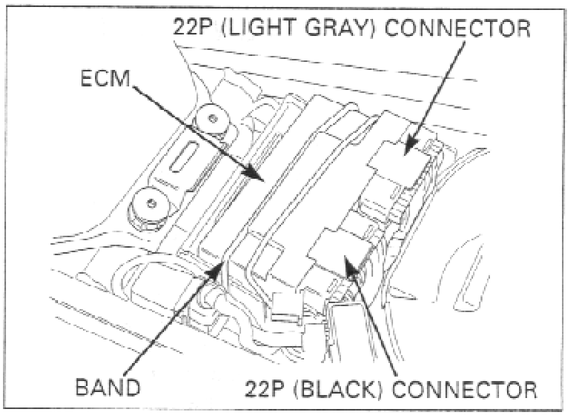
Connect the peak voltage adaptor to the digital multimeter.



TOOLS:
Peak voltage tester (U.S.A. only) or
Peak voltage adaptor **07HGJ-0020100 (not available in U.S.A.)**
with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

TEST HARNESS CONNECTION

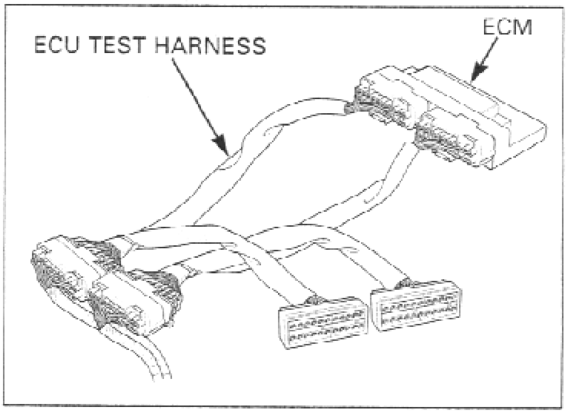
Remove the rear cowl (page 2-2).



Remove the ECM holder band and remove the ECM from the battery tray cover.
Disconnect the ECM 22P (Black) and 22P (Light gray) connectors.

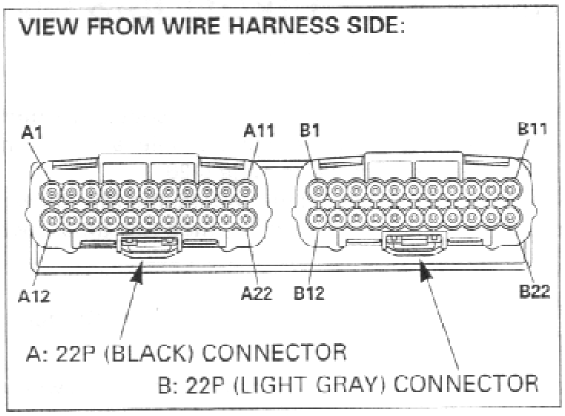
Connect the ECU test harnesses between the main wire harness and the ECM.

TOOL:
ECU test harness **07YMZ-0010100 (two required)**

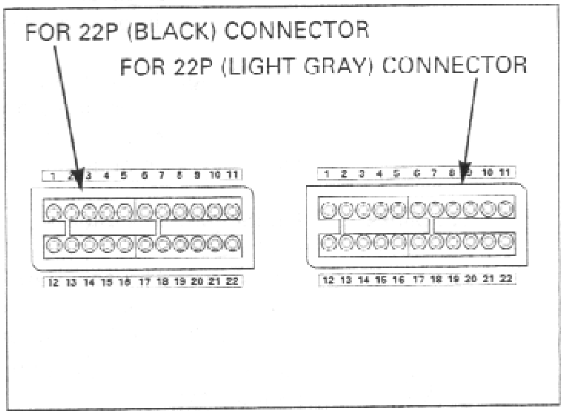


TEST HARNESS TERMINAL LAYOUT

The ECM connector terminals are numbered as shown in the illustration.



The test harness terminals are the same layout as for the ECM connector terminals as shown.



PGM-FI SELF-DIAGNOSIS MALFUNCTION INDICATOR LAMP (MIL) FAILURE CODES

- The PGM-FI MIL denotes the failure codes (the number of blinks from 0 to 33). When the indicator lights for 1.3 seconds it is equivalent to 10 blinks. For example, a 1.3 second illumination and two blinks (0.5 second X 2) of the indicator equals 12 blinks. Follow code 12 on page 5-26.
- When more than one failure occurs, the MIL shows the blinks in the order of lowest number to highest number. For example, if the indicator blinks once, then two times, two failures have occurred. Follow codes 1 and 2 on page 5-12.

Number of PGM-FI MIL blinks		Causes	Symptoms (Fail-safe contents)	Refer to page
0	No blinks	• Open circuit at the power input wire of the ECM • Faulty bank angle sensor • Open circuit in bank angle sensor related circuit • Faulty engine stop relay • Open circuit in engine stop relay related wires • Faulty engine stop switch • Open circuit in engine stop switch related wires • Faulty ignition switch • Faulty ECM • Blown PGM-FI fuse (20 A) • Open circuit in engine stop switch ground • Blown sub-fuse (10 A) (Starter/ignition)	• Engine does not start	5-85
	No blinks	• Open or short circuit in MIL wire • Faulty ECM	• Engine operates normally	5-9
	Stay lit	• Short circuit in service check connector • Faulty ECM • Short circuit in service check connector wire	• Engine operates normally	—
1	Blinks	• Loose or poor contacts on MAP sensor connector • Open or short circuit in MAP sensor wire • Faulty MAP sensor	• Engine operates normally	5-12
2	Blinks	• Loose or poor connection of the MAP sensor vacuum hose • Faulty MAP sensor	• Engine operates normally	5-14
7	Blinks	• Loose or poor contact on ECT sensor • Open or short circuit in ECT sensor wire • Faulty ECT sensor	• Hard start at a low temperature (simulate using numerical values; 90°C/194°F)	5-16
8	Blinks	• Loose or poor contact on TP sensor connector • Open or short circuit in TP sensor wire • Faulty TP sensor	• Poor engine response when operating the throttle quickly (simulate using numerical values; Throttle opens 0°)	5-18
9	Blinks	• Loose or poor contact on IAT sensor • Open or short circuit in IAT sensor wire • Faulty IAT sensor	• Engine operates normally (simulate using numerical values; 25°C/77°F)	5-22

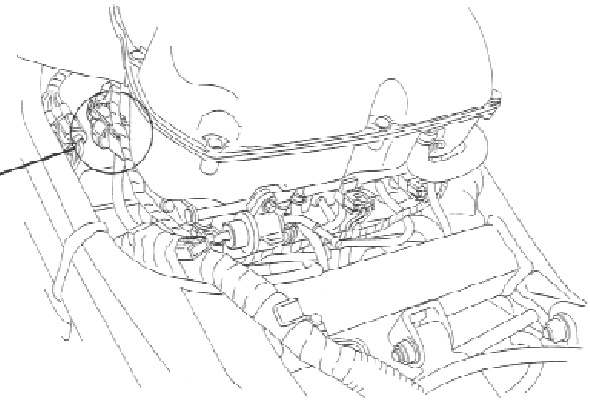
Number of PGM-FI malfunction indicator blinks		Causes	Symptoms (Fail-safe contents)	Refer to page
11	Blinks	• Loose or poor contact on vehicle speed sensor connector • Open or short circuit in vehicle speed sensor connector • Faulty vehicle speed sensor	• Engine operates normally	5-24
12	Blinks	• Loose or poor contact on No.1 injector connector • Open or short circuit in No.1 injector wire • Faulty No.1 injector	• Engine does not start	5-26
13	Blinks	• Loose or poor contact on No.2 injector connector • Open or short circuit in No.2 injector wire • Faulty No.2 injector	• Engine does not start	5-29
14	Blinks	• Loose or poor contact on No.3 injector connector • Open or short circuit in No.3 injector wire • Faulty No.3 injector	• Engine does not start	5-32
15	Blinks	• Loose or poor contact on No.4 injector connector • Open or short circuit in No.4 injector wire • Faulty No.4 injector	• Engine does not start	5-35
18	Blinks	• Loose or poor contact on cam pulse generator • Open or short circuit in cam pulse generator • Faulty cam pulse generator	• Engine does not start	5-38
19	Blinks	• Loose or poor contact on ignition pulse generator connector • Open or short circuit in ignition pulse generator • Faulty ignition pulse generator	• Engine does not start	5-40
21	Blinks	• Faulty O_2 sensor (California type only)	• Engine operates normally	5-42
23	Blinks	• Faulty O_2 sensor heater (California type only)	• Engine operates normally	5-44
33	Blinks	• Faulty E^2-PROM in ECM	• Engine operates normally • Does not hold the self-diagnosis data	5-48

PGM-FI MIL 1 BLINK (MAP SENSOR)

Turn the ignition switch to "OFF".

↓

Disconnect the MAP sensor 3P connector.
Check for loose or poor contact on the MAP sensor connector.



↓

Connect the MAP sensor connector.
Place the motorcycle on its side stand.
Start the engine and check that the MIL blinks.

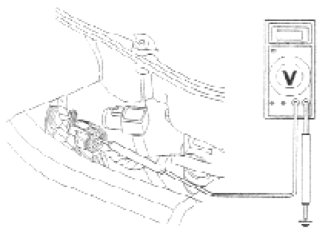
Does not blinks → • Loose or poor contact on the MAP sensor connector.

↓ 1 blink

Turn the ignition switch to "OFF".

↓

Disconnect the MAP sensor 3P connector.
Turn the ignition switch to "ON".
Measure the voltage at the wire harness side connector.

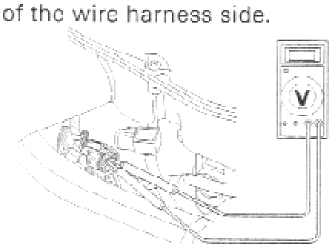


Connection: Yellow/Red (+) – Ground (–)
Standard: 4.75 – 5.25 V

Out of range → • Open or short circuit in Yellow/Red wire.
• Loose or poor contact on the ECM connectors.

↓ Voltage exists

Measure the voltage between the connector terminals of the wire harness side.

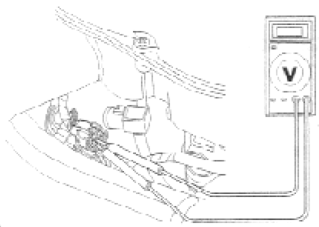


Connection: Yellow/Red (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

Out of range → • Open or short circuit in Green/Orange wire.
• Loose or poor contact on the ECM connectors.

↓ Voltage exists

Measure the voltage between the terminals of the wire harness side.

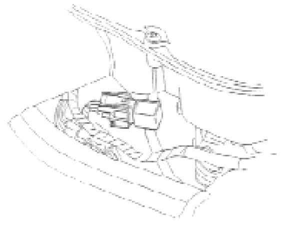


Connection:
Light green/Yellow (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

Out of range →
- Open or short circuit in Light green/Yellow wire.
- Loose or poor contact on the ECM connectors.

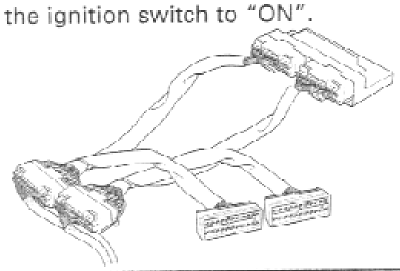
↓ Voltage exists

Turn the ignition switch to "OFF".
Connect the MAP sensor 3P connector.



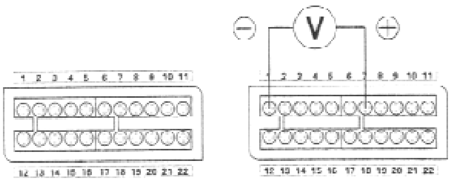
↓

Disconnect the ECM connectors.
Connect the test harness to ECM connectors.
Turn the ignition switch to "ON".



↓

Measure the voltage at the test harness terminals (page 5-9).



Connection: B7 (+) – B1 (–)
Standard: 2.7 – 3.1 V (760 mm Hg/1,013 kPa)

Out of range →
- Faulty MAP sensor.

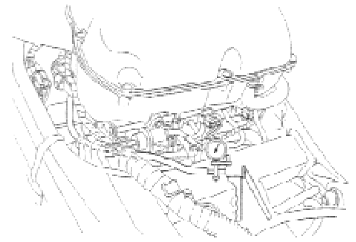
Voltage exists →
- Replace the ECM with a new one, and inspect it again.

PGM-FI MIL 2 BLINKS (MAP SENSOR)

Turn the ignition switch to "OFF".

↓

Disconnect the vacuum hose from the MAP sensor.
Connect the vacuum gauge between the throttle body and the MAP sensor using a 3-way joint.
Start the engine and measure the manifold absolute pressure at idle speed.



Standard: 150 – 250 mm Hg

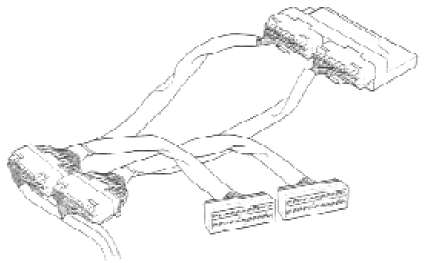
Out of range → • Check hose installation.

↓

Disconnect the vacuum gauge and connect the hose to the MAP sensor.

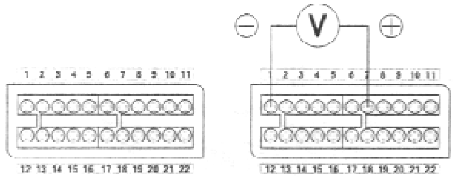
↓

Disconnect the ECM connectors.
Connect the test harness to the ECM connector.



↓

Turn the ignition switch to "ON".
Measure the voltage at the test harness terminals (page 5-9).

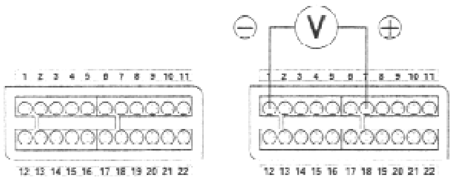


Connection: B7 (+) – B1 (–)
Standard: 2.7 – 3.1 V (760 mm Hg/1,013 kPa)

Out of range → • Faulty MAP sensor.

Voltage exists ↓

Start the engine.
Measure the voltage at the test harness terminals (page 5-9).



Connection: B7 (+) – B1 (–)
Standard: 2.7 V maximum

Out of range → • Faulty MAP sensor.

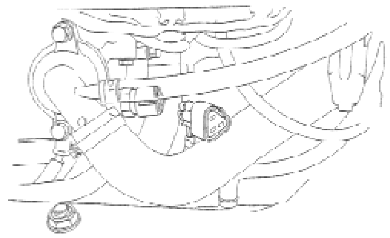
Voltage exists → • Replace the ECM with a new one, and inspect it again.

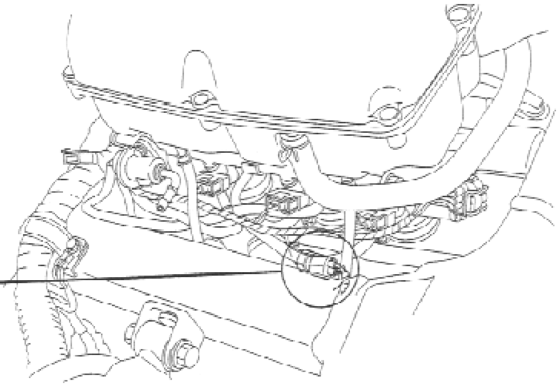
PGM-FI MIL 7 BLINKS (ECT SENSOR)

Turn the ignition switch to "OFF".

↓

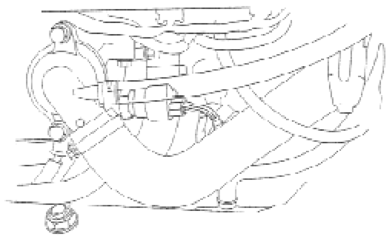
Disconnect the ECT sensor 3P connector.
Check for loose or poor contact on the ECT sensor connector.





↓

Connect the ECT sensor connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON".

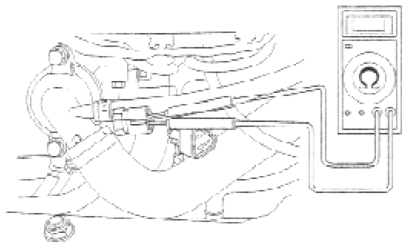


Check that the MIL blinks.

No blinks → • Loose or poor contact on the ECT sensor connector.

↓ 7 blinks

Turn the ignition switch to "OFF".
Disconnect the ECT sensor connector.
Measure the resistance at the ECT sensor terminals.

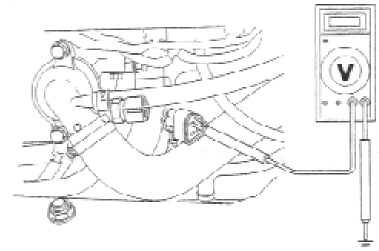


Connection: Pink (+) – Green/Orange (–)
(sensor side terminals)
Standard: 2.3 – 2.6 kΩ (20°C/68°F)

Abnormal → • Faulty ECT sensor.

↓ Normal

Turn the ignition switch to "ON".
Measure the voltage between the ECT sensor connector terminal of the wire harness side and ground.

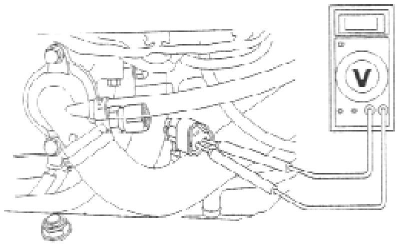


Connection: Pink/White (+) – Ground (–)
Standard: 4.75 – 5.25 V

Out of range →
- Open or short circuit in Pink and Pink/White wire.
- Loose or poor contacts on the ECM connector.

↓ Voltage exists

Measure the voltage at the ECT sensor connector of the wire harness side.



Connection: Pink/White (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

Out of range →
- Open or short circuit in Green/Orange wire.
- Loose or poor contacts on the ECM connector.

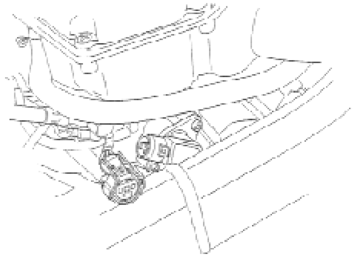
Voltage exists →
- Replace the ECM with a new one, and inspect it again.

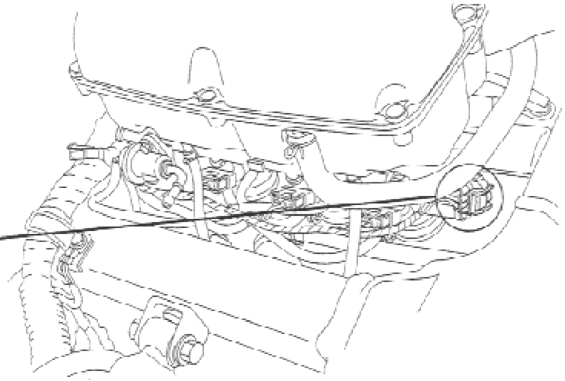
PGM-FI MIL 8 BLINKS (TP SENSOR)

Turn the ignition switch to "OFF".

↓

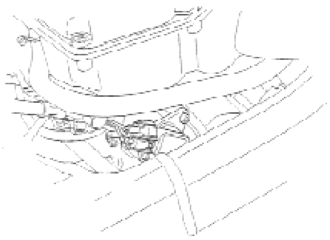
Disconnect the TP sensor 3P connector.
Check for loose or poor contact on the TP sensor connector.





↓

Connect the TP sensor connector.
Place the motorcycle on its side stand.
Start the engine and check that the MIL blinks.



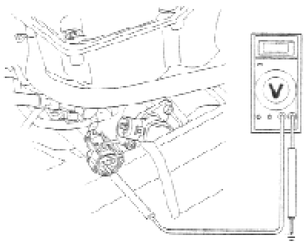
Does not blink → • Loose or poor contact on the TP sensor connector.

↓ 8 blinks

Turn the ignition switch to "OFF".

↓

Disconnect the TP sensor 3P connector.
Turn the ignition switch to "ON".
Measure the voltage between the wire harness side connector terminal and ground.

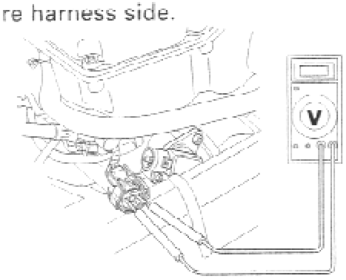


Connection: Yellow/Red (+) – Ground (–)
Standard: 4.75 – 5.25 V

Out of range →
- Open or short circuit in the Yellow/Red wire.
- Loose or poor contact on the ECM connector.

↓ Voltage exists

Measure the voltage at the TP sensor terminals of the wire harness side.

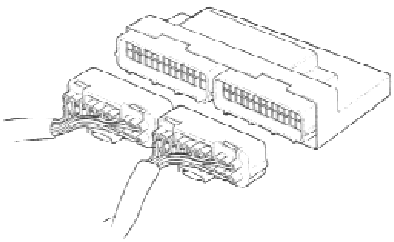


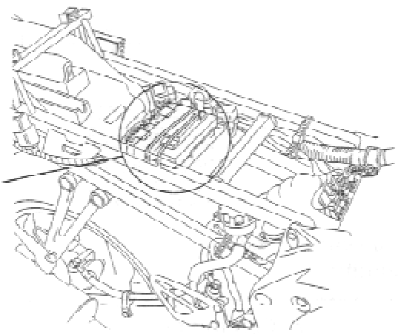
Connection: Yellow/Red (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

Out of range →
- Open or short circuit in Green/Orange wire.
- Loose or poor contact on the ECM connectors.

↓ Voltage exists

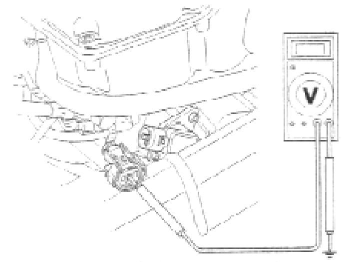
Turn the ignition switch to "OFF".
Disconnect the ECM 22P connectors.





↓

Check for continuity between the TP sensor connector terminal of the wire harness side and ground.

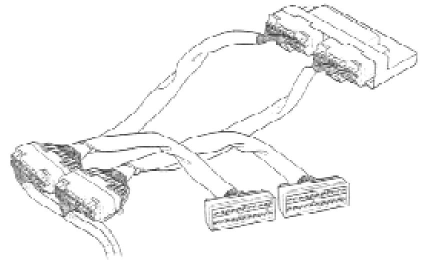


Connection: Red/Yellow (+) – Ground (–)
Standard: No continuity

Continuity →
- Short circuit in Red/Yellow wire.

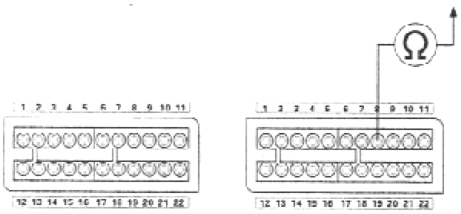
↓ No continuity

Connect the test harness to the ECM connectors.



↓

Check for continuity between the test harness terminal and the TP sensor connector terminal.

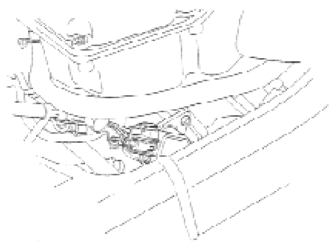


Connection: Red/Yellow – B8
Standard: Continuity

No continuity → • Open or short circuit in Red/Yellow wire.

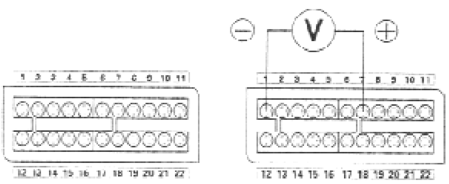
↓ Continuity

Connect the TP sensor 3P connector.



↓

Turn the ignition switch to "ON".
Measure the voltage at the test harness terminals.



Connection: B8 (+) – B1 (–)
Standard: *0.4 – 0.6 V (throttle fully closed)
***4.2 – 4.8 V (throttle fully open)**

Normal → • Replace the ECM with a new one, and inspect it again.

Out of range → • Faulty TP sensor.

A voltage marked * refers to the value when the voltage reading at the TP sensor 3P connector (page 5-19) shows 5 V. When the reading shows other than 5 V, derive a voltage at the test harness as follows:

In the case of a voltage of 4.75 V at the TP sensor 3P connector:

0.4 x 4.75/5.0 = 0.38 V
0.6 x 4.75/5.0 = 0.57 V

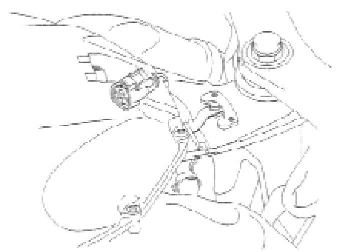
Thus, the solution is "0.38 – 0.57 V" with the throttle fully closed.
Replace 0.4 and 0.6 with 4.2 and 4.8 respectively, in the above equations to determine the throttle fully open range.

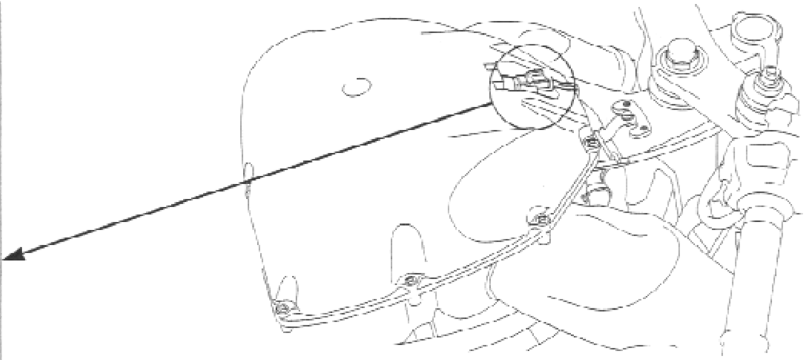
PGM-FI MIL 9 BLINKS (IAT SENSOR)

Turn the ignition switch to "OFF".

↓

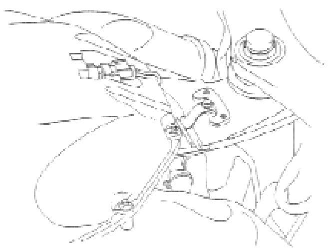
Disconnect the IAT sensor 2P connector.
Check for loose or poor contact on the IAT sensor connector.





↓

Connect the IAT sensor 2P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON".
Check that the MIL blinks.



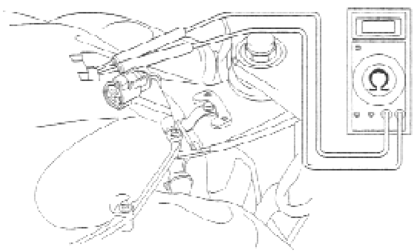
Does not blink → • Loose or poor contact on the IAT sensor connector.

↓ 9 blinks

Turn the ignition switch to "OFF".

↓

Disconnect the IAT sensor 2P connector.
Measure the resistance at the IAT sensor (at 20 – 30 °C/68 – 86 °F).



Standard: 1 – 4 kΩ

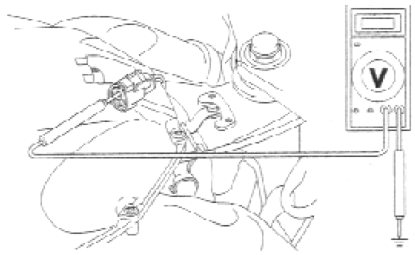
Abnormal → • Faulty IAT sensor.

↓ Normal

Turn the ignition switch to "ON".

↓

Measure the voltage between the terminals of the wire harness side.

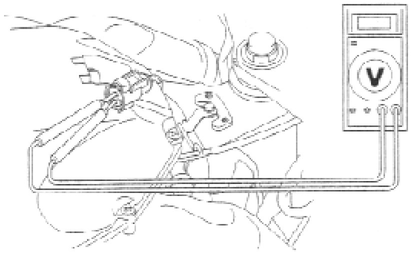


Connection:
Gray/Blue (+) – Ground (–)
Standard: 4.75 – 5.25 V

Out of range →
- Open or short circuit in Gray/Blue wire.
- Loose or poor contact on the ECM connectors.

↓ Voltage exists

Measure the voltage between the terminals of the wire harness side.



Connection:
Gray/Blue (+) – Green/Orange (–)
Standard: 4.75 – 5.25 V

Out of range →
- Open or short circuit in Green/Orange wire.
- Loose or poor contact on the ECM connectors.

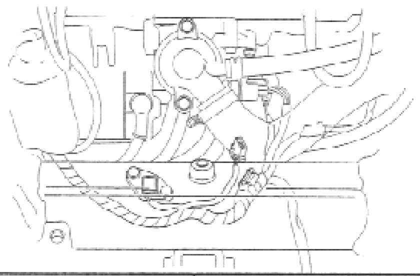
Voltage exists →
- Replace the ECM with a new one, and inspect it again.

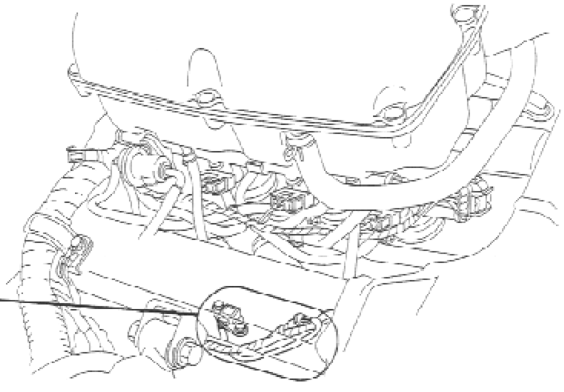
PGM-FI MIL 11 BLINKS (VEHICLE SPEED SENSOR)

Turn the ignition switch to "OFF".

↓

Disconnect the vehicle speed sensor 3P connector.
Check for loose or poor contact on the vehicle speed sensor connector.





↓

Connect the vehicle speed sensor 3P connector.
Start the engine.
Ride the motorcycle and keep the engine revs more than 5,000 rpm for 20 seconds or more.
Put the side stand down and check that the MIL blinks.

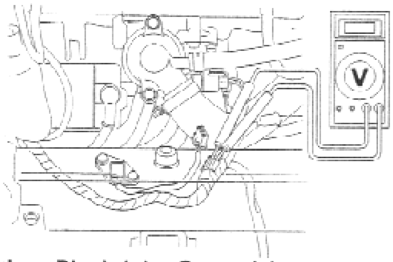
Does not blink → • Loose or poor contact on the vehicle speed sensor connector.

↓ 11 blinks

Turn the ignition switch to "OFF".

↓

Disconnect the vehicle speed sensor 3P connector.
Turn the ignition switch to "ON".
Measure the voltage at the wire harness side connector.

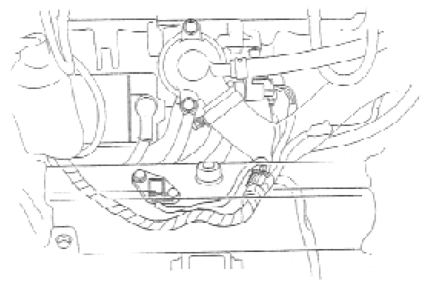


Connection: Black (+) – Green (–)
Standard: 12 V

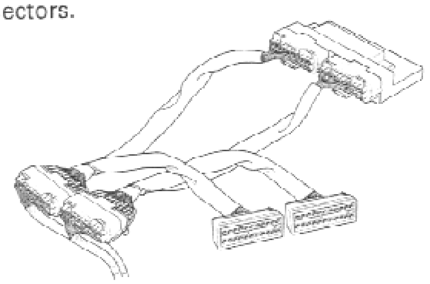
Out of range →
- Open or short circuit in Black wire of the engine sub-harness.
- Open or short circuit in Black/Brown wire of the main wire harness.

↓ Voltage exists

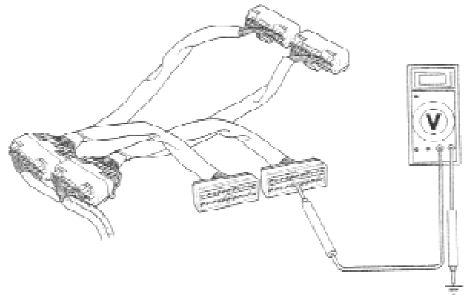
Connect the speed sensor 3P connector.



Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Support the motorcycle securely and place the rear wheel off the ground.
Shift the transmission into 1st gear.
Measure the voltage at the test harness terminals with the ignition switch is turned to "ON" while slowly turning the rear wheel by hand.



CONNECTION: Pink/Green (+) – Ground (–)
STANDARD: Repeat 0 to 5V

Abnormal

- Open or short circuit in Pink wire of the engine sub-harness.
- Open or short circuit in Pink/Green wire of the main wire harness.

Normal

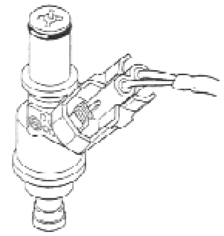
- Replace the ECM with a new one, and inspect it again.

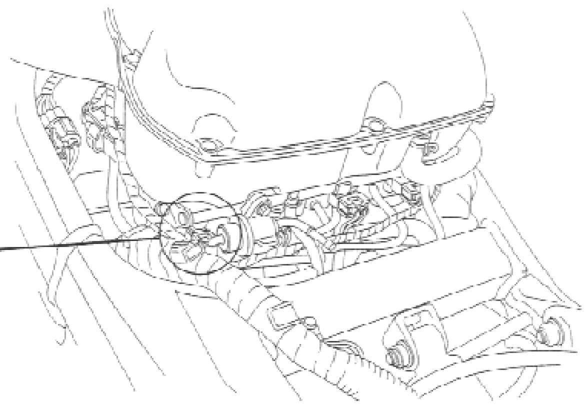
PGM-FI MIL 12 BLINKS (No.1 INJECTOR)

Turn the ignition switch to "OFF".

↓

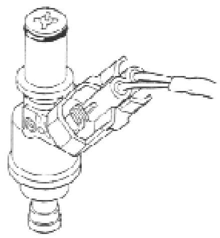
Disconnect the No.1 injector 2P connector.
Check for loose or poor contact on the No.1 injector 2P connector.





↓

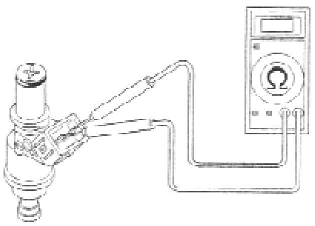
Connect the No.1 injector 2P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON".
Check that the MIL blinks.



Does not blink → • Loose or poor contact on the No.1 injector connector.

↓ 12 blinks

Turn the ignition switch to "OFF".
Disconnect the No.1 injector 2P connector and measure the resistance of the No.1 injector.

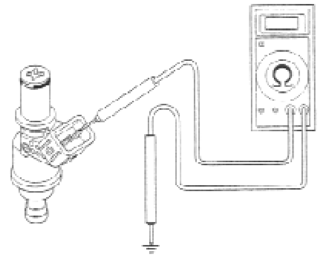


Connection:
Black/White (+) – Pink/Yellow (–)
Standard: 11.1 – 12.3 Ω (20°C/68°F)

Abnormal → • Faulty No.1 injector.

↓ Normal

Check for continuity between the No.1 injector and ground.

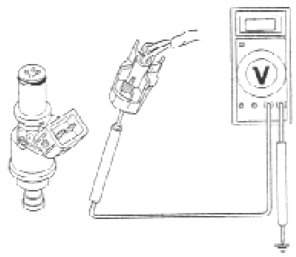


Connection:
Black/White (+) – Ground (–)
Standard: No continuity

Continuity → • Faulty No.1 injector.

No continuity ↓

Turn the ignition switch to "ON".
Measure the voltage between the No.1 injector connector of the wire harness side and ground.

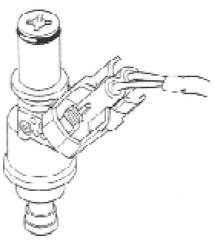


Connection:
Black/White (+) – Ground (–)
Standard: Battery voltage

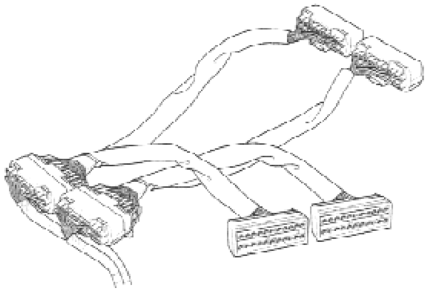
Out of range → • Open or short circuit in Black/White wire.

Voltage exists ↓

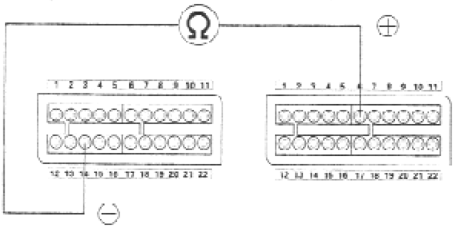
Turn the ignition switch to "OFF".
Connect the No.1 injector connector.



Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Measure the resistance at the test harness terminals.

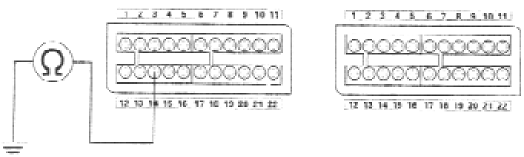


Connection: A14 (–) – B6 (+)
Standard: 9 – 15 Ω (20°C/68°F)

Out of range → • Open circuit in Black/White and/or Pink/Yellow wire.

Normal ↓

Check for continuity between the test harness terminal and ground.



Connection: A14 – Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Yellow wire.

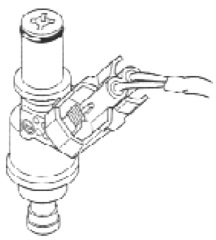
No continuity → • Replace the ECM with a new one, and inspect it again.

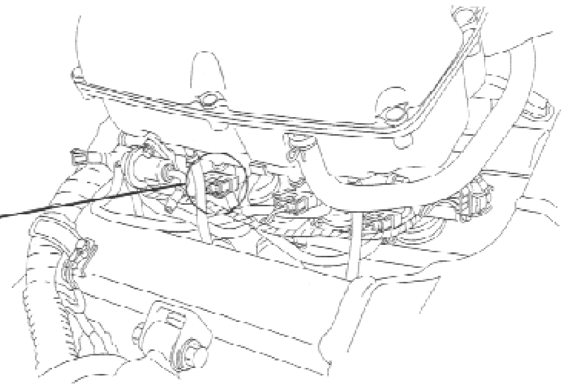
PGM-FI MIL 13 BLINKS (No.2 INJECTOR)

Turn the ignition switch to "OFF".

↓

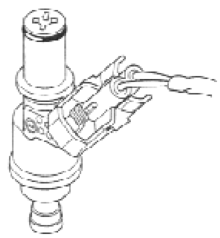
Disconnect the No.2 injector 2P connector.
Check for loose or poor contact on the No.2 injector 2P connector.





↓

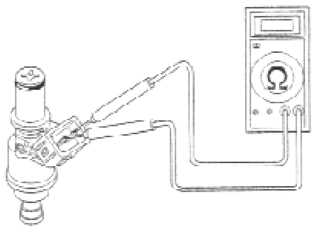
Connect the No.2 injector 2P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON".
Check that the MIL blinks.



Does not blink → • Loose or poor contact on the No.2 injector connector.

↓ 13 blinks

Turn the ignition switch to "OFF".
Disconnect the No.2 injector 2P connector and measure the resistance of the No.2 injector.

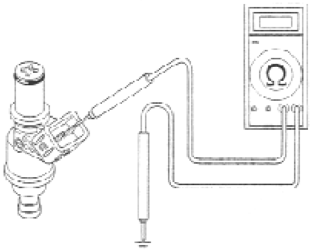


Connection:
Black/White (+) – Pink/Blue (–)
Standard: 11.1 – 12.3 Ω (20°C/68°F)

Abnormal → • Faulty No.2 injector.

↓ Normal

Check for continuity between the No.2 injector and ground.

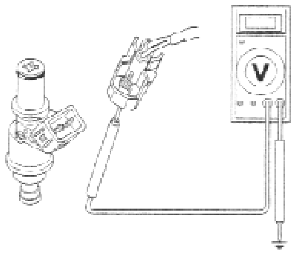


Connection:
Black/White (+) – Ground (–)
Standard: No continuity

Continuity → • Faulty No.2 injector.

↓ No continuity

Turn the ignition switch to "ON".
Measure the voltage between the No.2 injector connector of the wire harness side and ground.

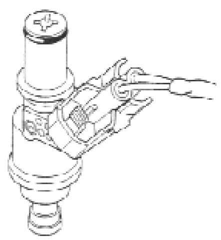


Connection:
Black/White (+) – Ground (–)
Standard: Battery voltage

Out of range → • Open or short circuit in Black/White wire.

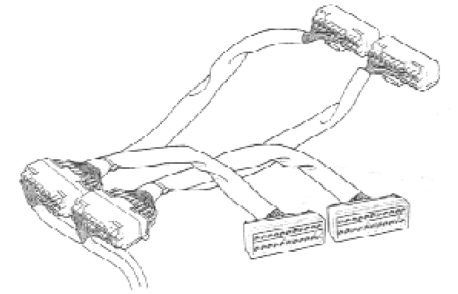
↓ Voltage exists

Turn the ignition switch to "OFF".
Connect the No.2 injector connector.

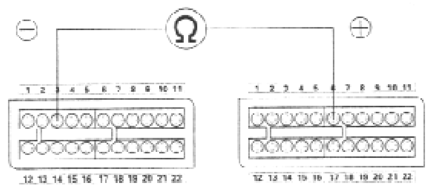


↓

Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Measure the resistance at the test harness terminals.

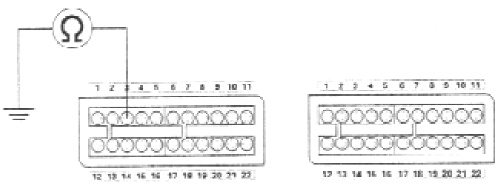


Connection: A3 (–) – B6 (+)
Standard: 9 – 15 Ω (20°C/68°F)

Out of range → • Open circuit in Black/White and/or Pink/Blue wire.

Normal ↓

Check for continuity between the test harness terminal and ground.



Connection: A3 – Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Blue wire.

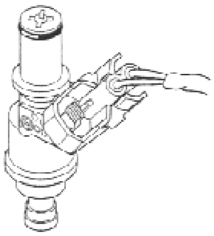
No continuity → • Replace the ECM with a new one, and inspect it again.

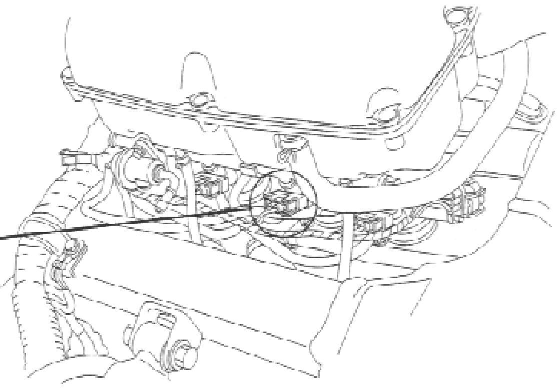
PGM-FI MIL 14 BLINKS (No.3 INJECTOR)

Turn the ignition switch to "OFF".

↓

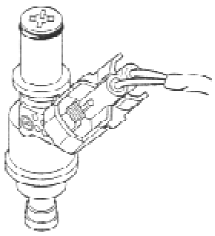
Disconnect the No.3 injector 2P connector.
Check for loose or poor contact on the No.3 injector 2P connector.





↓

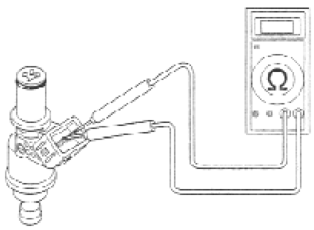
Connect the No.3 injector 2P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON".
Check that the MIL blinks.



Does not blink → • Loose or poor contact on the No.3 injector connector.

↓ 14 blinks

Turn the ignition switch to "OFF".
Disconnect the No.3 injector 2P connector and measure the resistance of the No.3 injector.

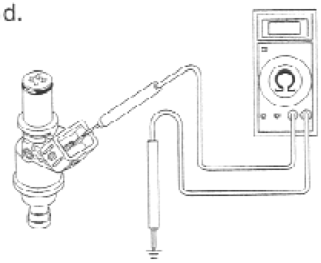


Connection:
Black/White (+) – Pink/Green (–)
Standard: 11.1 – 12.3 Ω (20°C/68°F)

Abnormal → • Faulty No.3 injector.

↓ Normal

Check for continuity between the No.3 injector and ground.

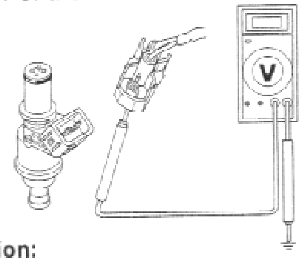


Connection:
Black/White (+) – Ground (–)
Standard: No continuity

Continuity → • Faulty No.3 injector.

No continuity ↓

Turn the ignition switch to "ON".
Measure the voltage between the No.3 injector connector of the wire harness side and ground.

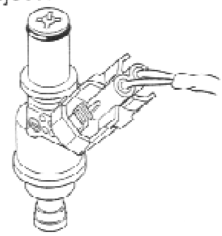


Connection:
Black/White (+) – Ground (–)
Standard: Battery voltage

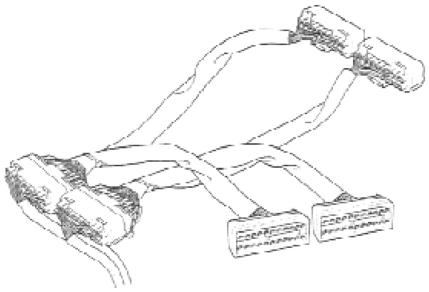
Out of range → • Open or short circuit in Black/White wire.

Voltage exists ↓

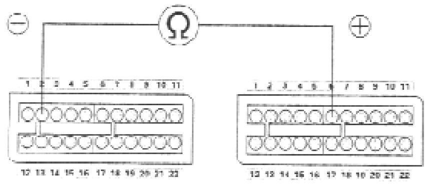
Turn the ignition switch to "OFF".
Connect the No.3 injector connector.



Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Measure the resistance at the test harness terminals.

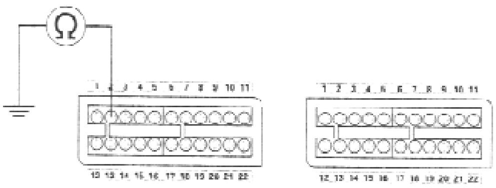


Connection: A2 (–) – B6 (+)
Standard: 9 – 15 Ω (20°C/68°F)

Out of range → • Open circuit in Black/White and/or Pink/Green wire.

Normal ↓

Check for continuity between the test harness terminal and ground.



Connection: A2 – Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Green wire.

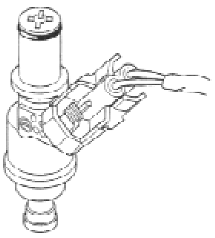
No continuity → • Replace the ECM with a new one, and inspect it again.

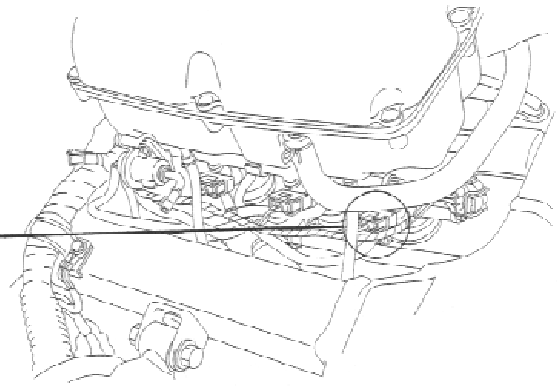
PGM-FI MIL 15 BLINKS (No.4 INJECTOR)

Turn the ignition switch to "OFF".

↓

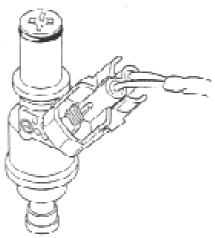
Disconnect the No.4 injector 2P connector.
Check for loose or poor contact on the No.4 injector 2P connector.





↓

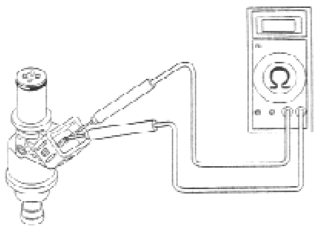
Connect the No.4 injector 2P connector.
Place the motorcycle on its side stand.
Turn the ignition switch to "ON".
Check that the MIL blinks.



Does not blink → • Loose or poor contact on the No.4 injector connector.

↓ 15 blinks

Turn the ignition switch to "OFF".
Disconnect the No.4 injector 2P connector and measure the resistance of the No.4 injector.

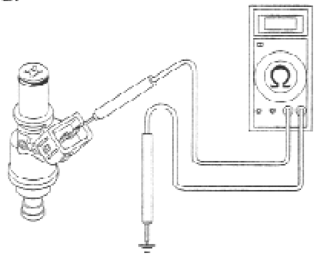


Connection:
Black/White (+) – Pink/Black (–)
Standard: 11.1 – 12.3 Ω (20°C/68°F)

Abnormal → • Faulty No.4 injector.

↓ Normal

Check for continuity between the No.4 injector and ground.

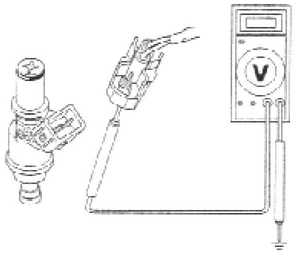


Connection:
Black/White (+) – Ground (–)
Standard: No continuity

Continuity → • Faulty No.4 injector.

No continuity ↓

Turn the ignition switch to "ON".
Measure the voltage between the No.4 injector connector of the wire harness side and ground.

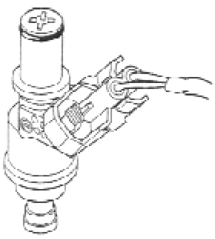


Connection:
Black/White (+) – Ground (–)
Standard: Battery voltage

Out of range → • Open or short circuit in Black/White wire.

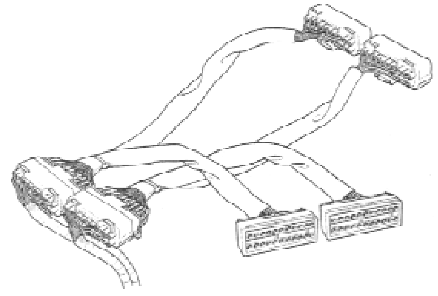
Voltage exists ↓

Turn the ignition switch to "OFF".
Connect the No.4 injector connector.

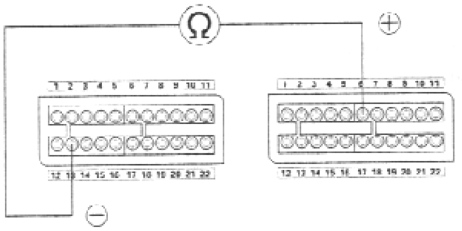


↓

Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



Measure the resistance at the test harness terminals.

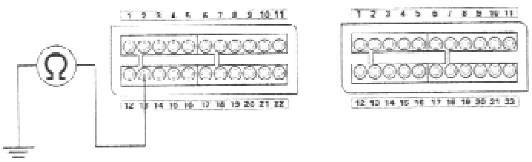


Connection: A13 (–) – B6 (+)
Standard: 9 – 15 Ω (20°C/68°F)

Out of range → • Open circuit in Black/White and/or Pink/Black wire.

Normal ↓

Check for continuity between the test harness terminal and ground.



Connection: A13 – Ground
Standard: No continuity

Continuity → • Short circuit in Pink/Black wire.

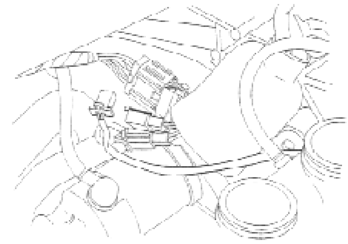
No continuity → • Replace the ECM with a new one, and inspect it again.

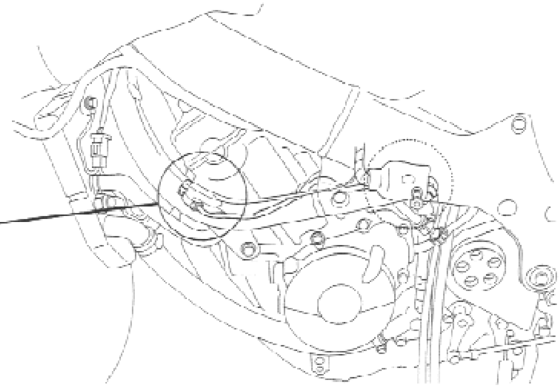
PGM-FI MIL 18 BLINKS (CAM PULSE GENERATOR)

Turn the ignition switch to "OFF".

↓

Disconnect the cam pulse generator 2P connector.
Check for loose or poor contact on the cam pulse generator 2P connector.





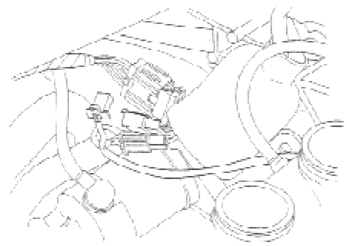
↓

Connect the cam pulse generator 2P connector.
Place the motorcycle on its side stand.
Turn the starter motor for more than 10 seconds and then check that the MIL blinks.

Does not blink → • Loose or poor contact on the cam pulse generator 2P connector.

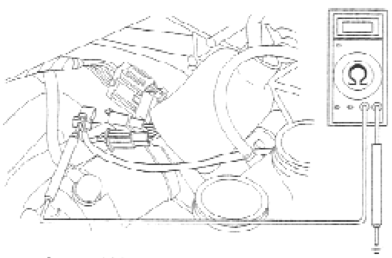
↓ 18 blinks

Turn the ignition switch to "OFF" and the engine stop switch to "OFF".
Disconnect the cam pulse generator 2P connector.



↓

Check the continuity between the cam pulse generator connector terminal and ground.

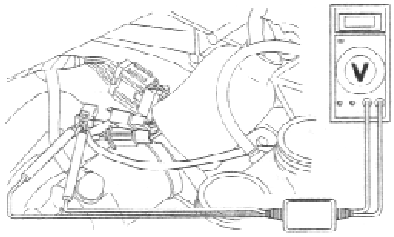


Connection: White/Yellow – Ground
Standard: No continuity

Continuity → • Faulty cam pulse generator.

↓ No continuity

Crank the engine with the starter motor and measure the cam pulse generator peak voltage at the cam pulse generator 2P connector.

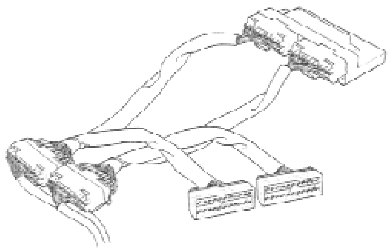


Connection: Gray (+) – White/Yellow (–)
Standard: 0.7 V minimum (20°C/68°F)

Out of range → • Faulty cam pulse generator.

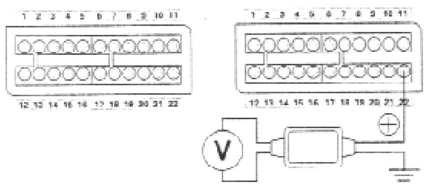
Normal ↓

Connect the cam pulse generator 2P connector.
Disconnect the ECM connectors.
Connect the test harness to ECM connectors.



↓

Crank the engine with the starter motor and measure the cam pulse generator peak voltage at the test harness terminals.



Connection: B22 (+) – Ground (–)
Standard: 0.7 V minimum (20°C/68°F)

Out of range → • Open circuit in White/Yellow and/or Gray wire.

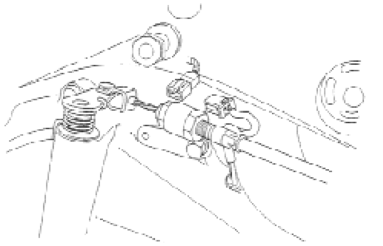
Normal → • Replace the ECM with a new one, and inspect it again.

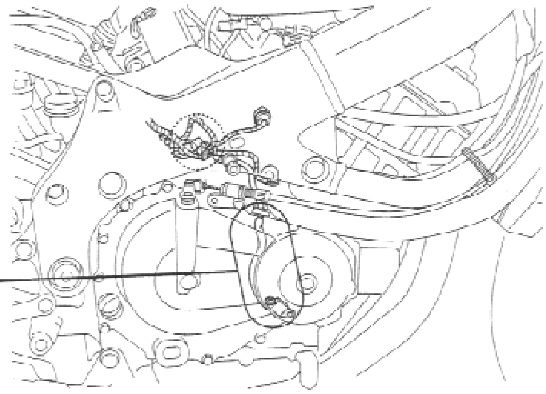
PGM-FI MIL 19 BLINKS (IGNITION PULSE GENERATOR)

Turn the ignition switch to "OFF".

↓

Disconnect the ignition pulse generator 2P connector.
Check for loose or poor contact on the ignition pulse generator 2P connector.





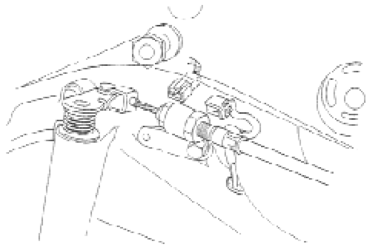
↓

Connect the ignition pulse generator 2P connector.
Place the motorcycle on its side stand.
Turn the starter motor for more than 10 seconds and then check that the MIL blinks.

Does not blink → • Loose or poor contact on the ignition pulse generator 2P connector.

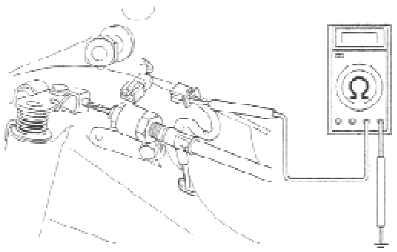
↓ 19 blinks

Turn the ignition switch to "OFF" and the engine stop switch to "OFF".
Disconnect the ignition pulse generator 2P connector.



↓

Check the continuity between the ignition pulse generator connector terminal and ground.

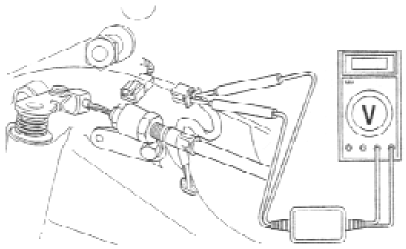


Connection: White/Yellow – Ground
Standard: No continuity

Abnormal → • Faulty ignition pulse generator.

↓ No continuity

Crank the engine with the starter motor and measure the ignition pulse generator peak voltage at the ignition pulse generator 2P connector.

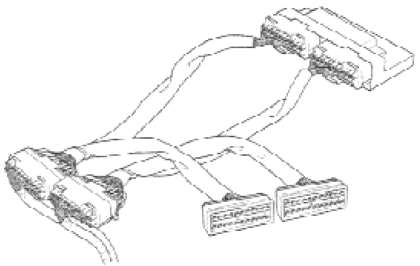


Connection: Yellow (+) – Yellow/White (–)
Standard: 0.7 V minimum (20°C/68°F)

Out of range → • Faulty ignition pulse generator.

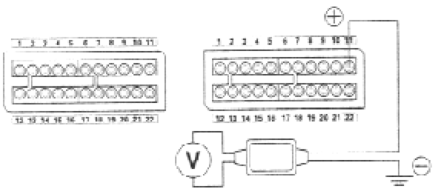
Normal ↓

Connect the ignition pulse generator 2P connector.
Disconnect the ECM connectors.
Connect the test harness to ECM connectors.



↓

Crank the engine with the starter motor and measure the ignition pulse generator peak voltage at the test harness terminals.



Connection: B11 (+) – Ground (–)
Standard: 0.7 V minimum (20°C/68°F)

Out of range →
- Open circuit in White/Yellow wire.
- Open circuit in Yellow wire.

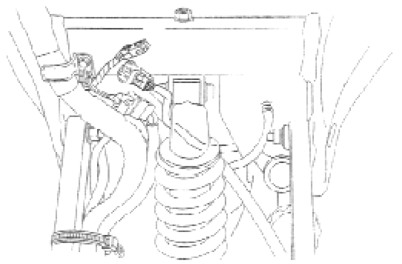
Normal →
- Replace the ECM with a new one, and inspect it again.

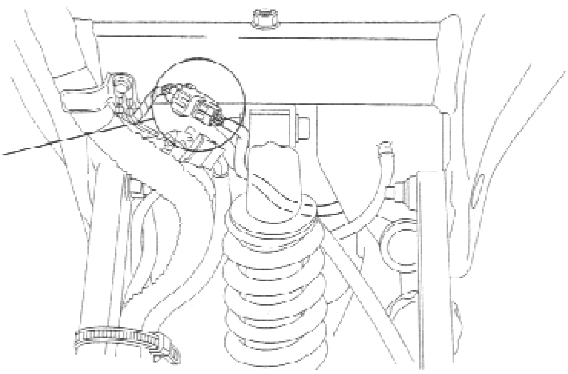
PGM-FI MIL 21 BLINKS (O_2 SENSOR/CALIFORNIA TYPE ONLY)

Turn the ignition switch to "OFF".

↓

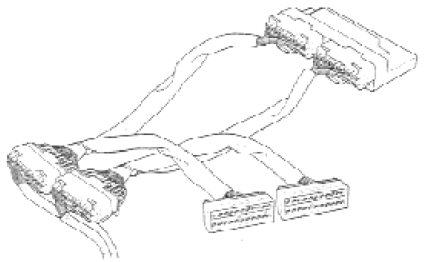
Disconnect the O_2 sensor connector.
Check for loose or poor contact on the O_2 sensor connector.





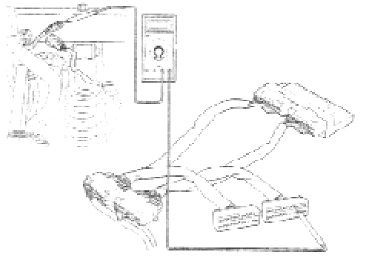
↓

Disconnect the ECM connectors.
Connect the test harness to ECM connectors.



↓

Check the continuity between the test harness terminal and O_2 sensor connector terminal.

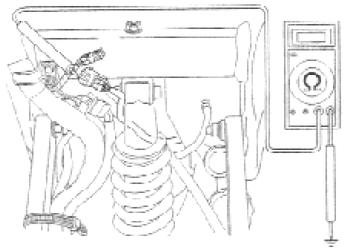


Connection: Orange/White – A5
Standard: Continuity

No continuity → • Open circuit in O_2 sensor Orange/White wire.

Continuity ↓

Check the continuity between the O_2 sensor connector terminal and ground.

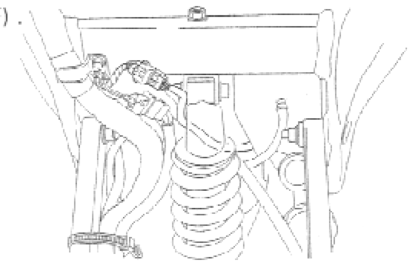


Connection: Orange/White – Ground
Standard: No continuity

Continuity → • Short circuit in O_2 sensor Orange/White wire.

No continuity ↓

Connect the O_2 sensor connector.
Turn the ignition switch to "ON" and warm up the
engine until the coolant temperature is 80°C (176°F).

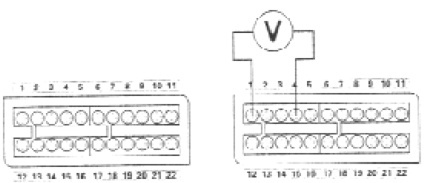


↓

Operate the throttle grip and snap the engine speed from idle to 5,000 rpm.

↓

Check the voltage between the test harness terminals.



Connection: B1 – B4
Standard:
With the throttle fully open:
0.6 V minimum
With the throttle quickly closed:
0.4 V maximum

Out of range → • Faulty O_2 sensor.

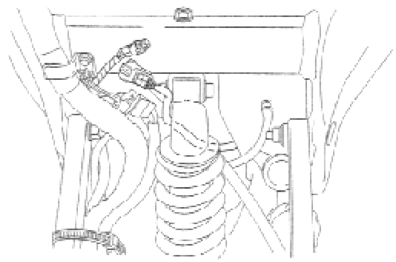
Normal → • Check the fuel supply system, if the system is correct, replace the ECM and inspect again.

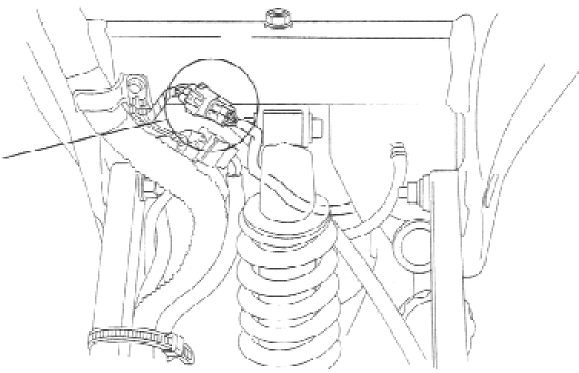
PGM-FI MIL 23 BLINKS (O_2 SENSOR HEATER/CALIFORNIA TYPE ONLY)

Turn the ignition switch to "OFF".

↓

Disconnect the O_2 sensor connectors.
Check for loose or poor contact on the O_2 sensor connector.





↓

Connect the O_2 sensor connector.
Place the motorcycle on its side stand.
Start the engine and check that the MIL blinks.

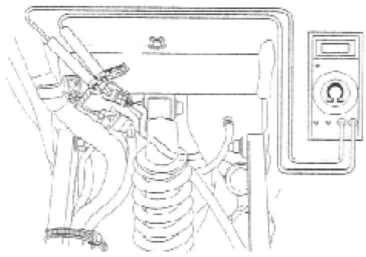
Does not blink → • Loose or poor contact on the O_2 sensor connector.

↓ 23 blinks

Turn the ignition switch to "OFF".

↓

Disconnect the O_2 sensor 4P connector.
Measure the resistance at the sensor side connector White terminals.

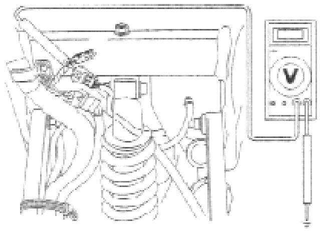


Connection: White – White
Standard: 10 – 40 Ω

Out of range → • Faulty O_2 sensor.

↓ Normal

Check for continuity between the White terminal and ground.

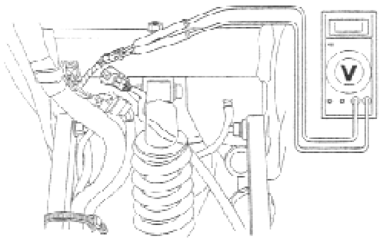


Connection: White – Ground
Standard: No continuity

Continuity → • Faulty O_2 sensor.

No continuity ↓

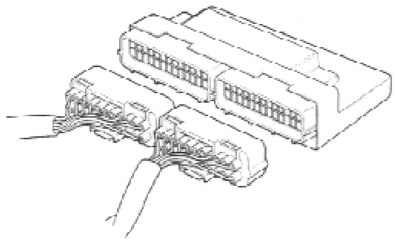
Turn the ignition switch to "ON".
Measure the voltage at the O_2 sensor wire harness side connector terminals.



Connection: Black/White (+) – Black/Green (–)
Standard: Battery voltage

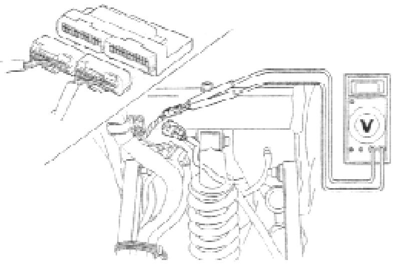
Normal →

Turn the ignition switch to "OFF".
Disconnect the ECM 22P connector.



↓

Turn the ignition switch to "ON".
Measure the voltage at the O_2 sensor wire harness side connector terminals.



Connection: Black/White (+) – Black/Green (–)
Standard: Battery voltage

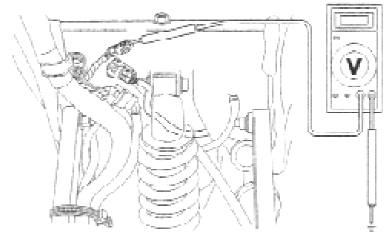
Battery voltage ↓

• Open circuit in O_2 sensor Black/Green wires.

No voltage ↓

• Replace the ECM and inspect again.

Measure the voltage at the O_2 sensor wire harness side connector terminal and ground.



Connection: Black/White (+) – Ground (–)
Standard: Battery voltage

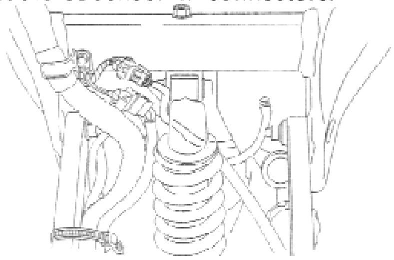
No voltage → • Open circuit in Black/White wire between the O_2 sensor and the engine stop relay.

Battery voltage ↓

Turn the ignition switch to "OFF".

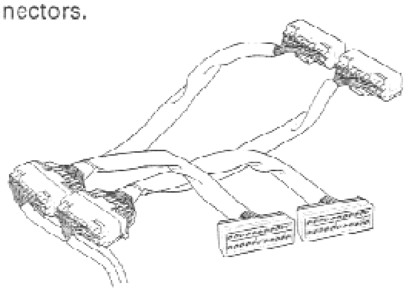
↓

Connect the O_2 sensor 4P connectors.



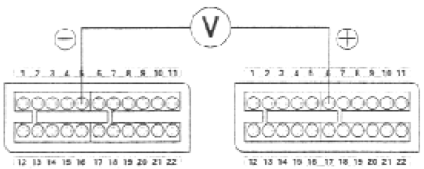
↓

Disconnect the ECM connectors.
Connect the test harness to the wire harness connectors.



↓

Measure the voltage at the test harness terminals.



Connection: B6 (+) – A5 (–)
Standard: Battery voltage

No voltage → • Open circuit in Black/Green wire between the ECM connector and O_2 sensor 4P connector.

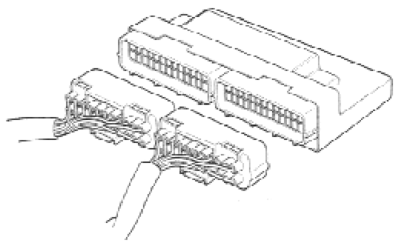
Battery voltage → • Replace the ECM and inspect again.

PGM-FI MIL 33 BLINKS (E^2-PROM)

Turn the ignition switch to "OFF".

↓

Disconnect the ECM connectors.
Check for loose or poor contact of the ECM connectors.



↓

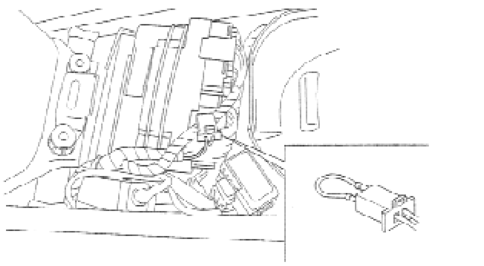
Connect the ECM connectors.
Short the service check connector with a jumper wire (page 5-6).
Turn the ignition switch to "ON" and check that the MIL blinks.

→ 33 blinks: Reset the self-diagnosis memory data (page 5-7).
Turn the ignition switch to "ON" and check that the MIL blinks.

- → 33 blinks: • Replace the ECM.
- → Blinks: go to "Remove the jumper wire from the service check connector (page 5-6)."

↓ Except 33 blinks

Remove the jumper wire from the service check connector (page 5-6).



↓

Turn the ignition switch to "ON" and check that the MIL blinks.

→ Does not blink 33 times: • No problem.

↓ 33 blinks

Turn the ignition switch to "OFF".

↓

Short the service check connector with a jumper wire (page 5-6).
Turn the ignition switch to "ON" and check that the MIL blinks.

Does not blink 33 times → • No problem.

↓ 33 blinks

Reset the self-diagnosis memory data (page 5-7).
Turn the ignition switch to "ON" and check that the MIL blinks.

Does not blink 33 times → • No problem.

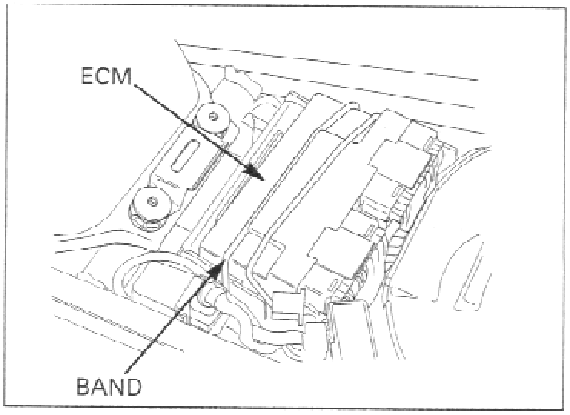
33 blinks → • Replace the ECM.

FUEL LINE INSPECTION

FUEL PRESSURE INSPECTION

NOTICE

- *Before disconnecting the fuel hoses, release the fuel pressure by loosening the service check bolt at the fuel tank.*
- *Always replace the sealing washers when the service check bolt is removed or loosened.*

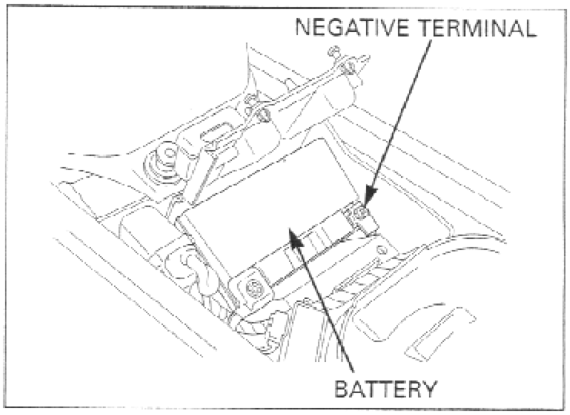


Remove the seat (page 2-2).

Remove the ECM holder band and remove the ECM from the battery cover.

Unhook the battery cover retainers, then open the battery cover.

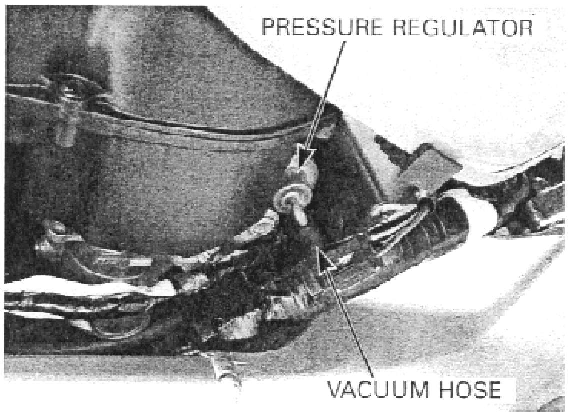
Disconnect the battery negative cable from the battery terminal.



Lift the fuel tank slowly, being careful not to overextend the fuel hose.

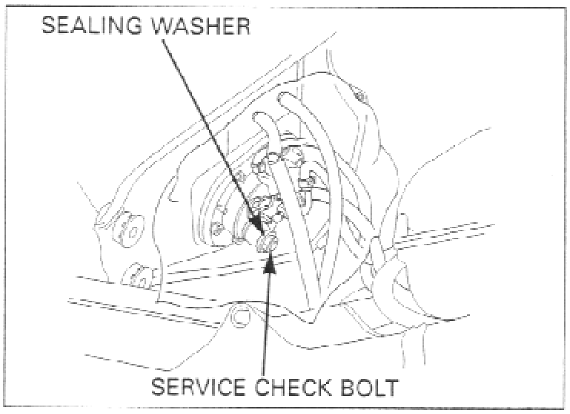
Support the front end of fuel tank (page 3-4).

Disconnect the pressure regulator vacuum hose and plug the vacuum hose.



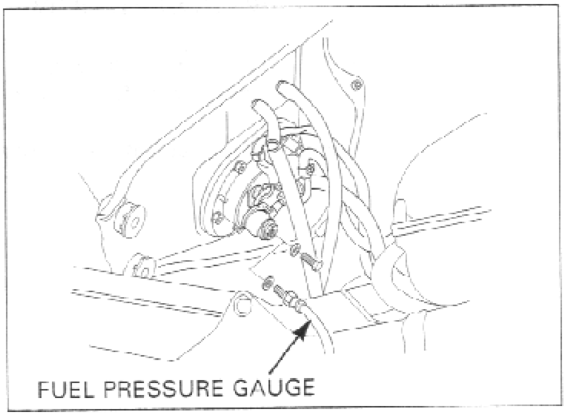
Cover the service check bolt with a rag or shop towel.

Slowly loosen the service check bolt and drain the remaining fuel into an approved gasoline container.



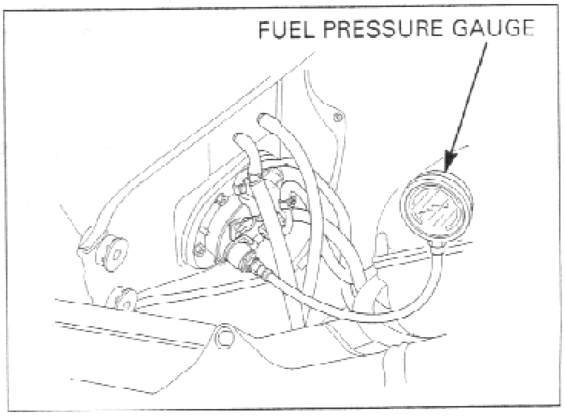
Remove the service check bolt and attach the fuel pressure gauge.

TOOL:
Fuel pressure gauge 07406–0040003 or 07406–0040002



Connect the battery negative cable.
Start the engine.
Read the fuel pressure at idle speed.

IDLE SPEED: **1,300 ± 100 rpm**
STANDARD: **343 kPa (3.5 kgf/cm², 50 psi)**



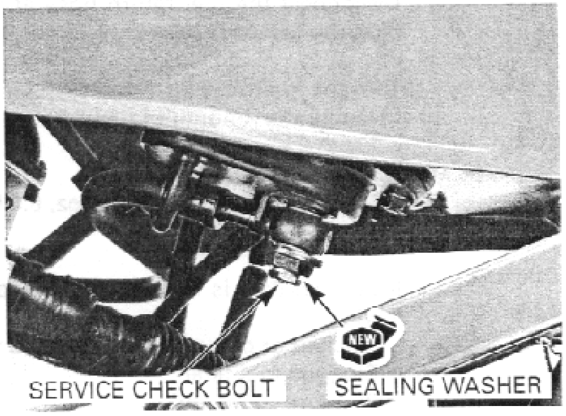
If the fuel pressure is higher than specified, inspect the following:
- Pinched or clogged fuel return hose
- Pressure regulator
- Fuel pump (page 5-53)

If the fuel pressure is lower than specified, inspect the following:
- Fuel line leaking
- Clogged fuel filter
- Pressure regulator
- Fuel pump (page 5-53)

Always replace the sealing washer when the service check bolt is removed or loosened.

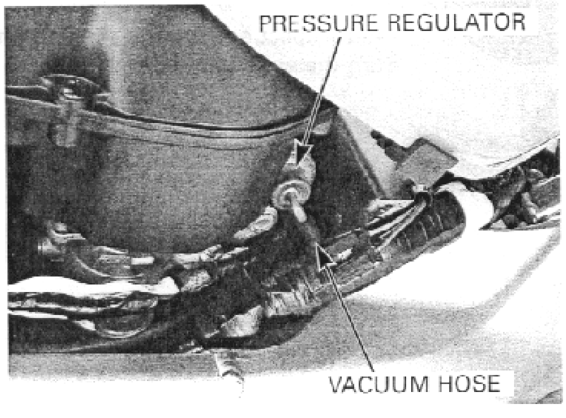
After inspection, remove the fuel pressure gauge and reinstall and tighten the service check bolt using the new sealing washer.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)



Connect the pressure regulator vacuum hose.

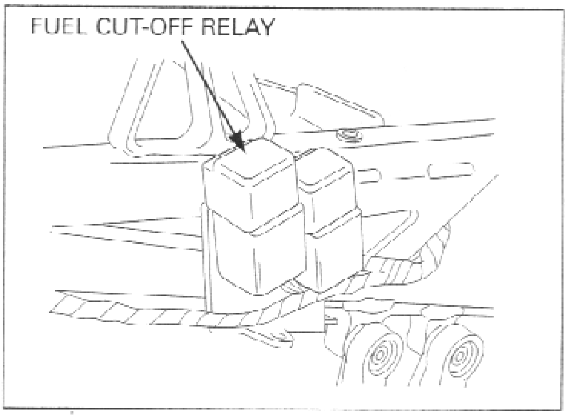
Install the removed parts in the reverse order of removal.



FUEL FLOW INSPECTION

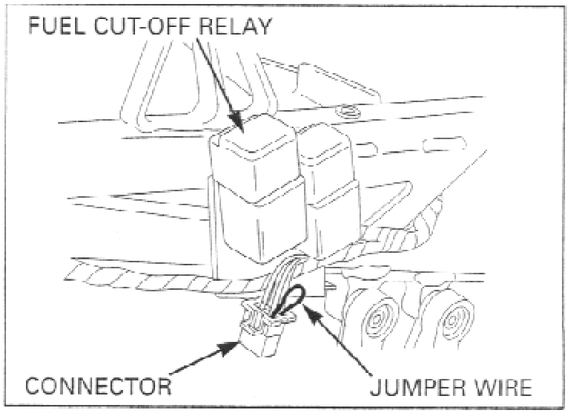
Remove the rear cowl (page 2-2).
Support the front end of fuel tank (page 3-4).

Disconnect the fuel cut-off relay connector.



Jump the Brown and Black/White wire terminals of the wire harness side using a jumper wire.

- When the fuel return hose is disconnected, gasoline may spill out from the hose. Place a approved gasoline container under the hose and drain the gasoline.
- Wipe off any spilled out gasoline.

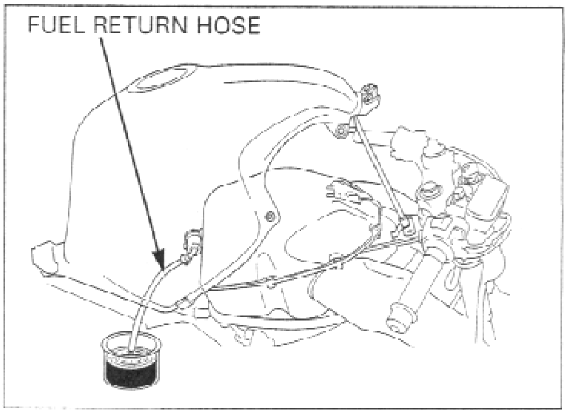


Disconnect the fuel return hose at the fuel tank and plug the fuel tank inlet joint.

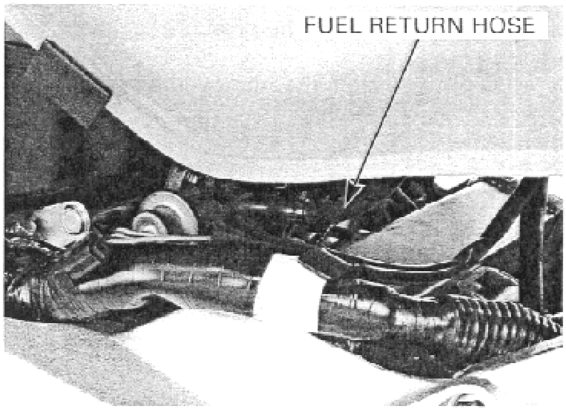
Turn the ignition switch to "ON" for 10 seconds.
Measure the amount of fuel flow.

Amount of fuel flow:
Minimum 188 cm^3 (6.4 US oz, 6.6 Imp oz) for 10 seconds at 12 V

If the fuel flow is less than specified, inspect the following:
- Pinched or clogged fuel hose and fuel return hose
- Clogged fuel filter
- Pressure regulator
- Fuel pump (page 5-53)



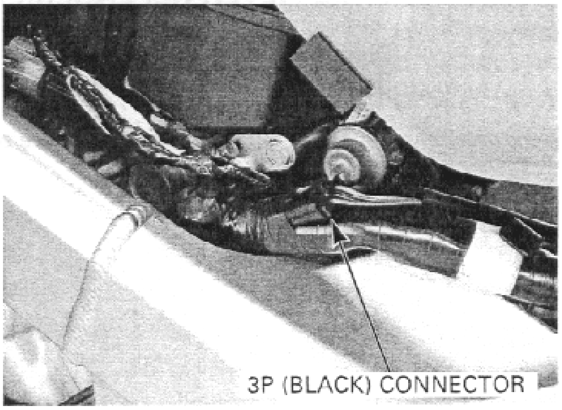
After inspection, connect the fuel return hose.
Start the engine and check for leak.



FUEL PUMP

INSPECTION

Turn the ignition switch to "ON" and confirm that the fuel pump operates for a few seconds.
If the fuel pump does not operate, inspect as follows:

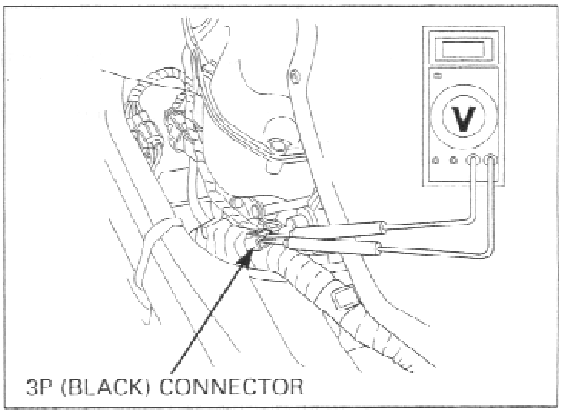


Support the front end of fuel tank (page 3-4).

Disconnect the fuel pump 3P (Black) connector.

Turn the ignition switch to "ON" and measure the voltage between the terminals.

Connection: Brown (+) – Green (–)



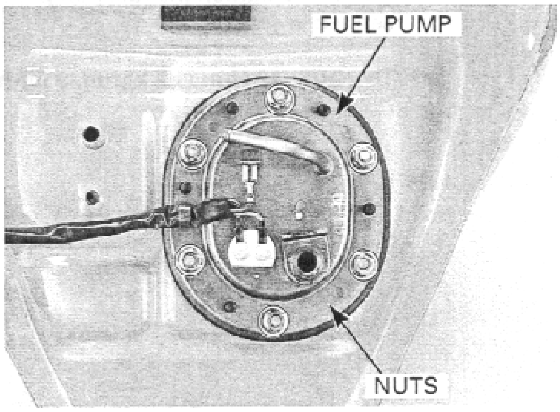
There should be battery voltage for a few seconds.

If there is battery voltage, replace the fuel pump.
If there is no battery voltage, inspect the following:
- Main fuse 30A
- Sub fuse 10A
- Engine stop switch (page 19-19)
- Fuel cut-off relay (page 5-54)
- Engine stop relay (page 5-84)
- Bank angle sensor (page 5-83)
- ECM (page 5-85)

REMOVAL

NOTICE

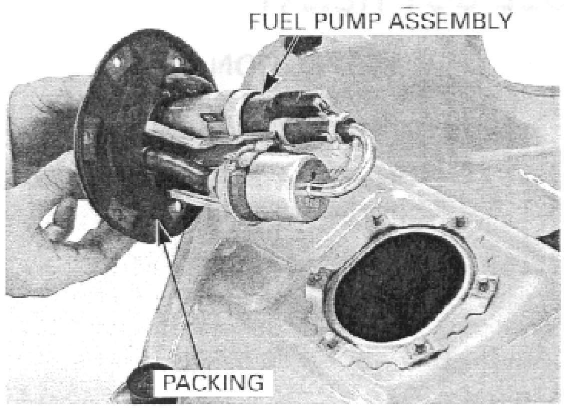
- *Before disconnecting the fuel hose, release the fuel pressure by loosening the service check bolt at the fuel tank.*
- *Always replace the sealing washers when the service check bolt is removed or loosened.*



Remove the fuel tank (page 5-55).

Remove the fuel pump mounting nuts.

Remove the fuel pump assembly and packing.

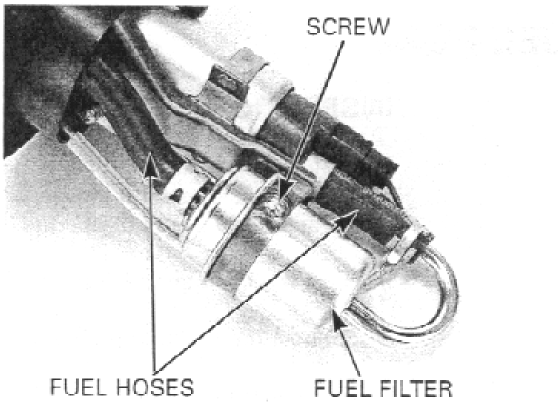


FUEL FILTER REPLACEMENT

Disconnect the fuel hoses from the fuel filter.
Remove the screws and fuel filter.

Note the direction of the fuel filter.

Install the fuel filter in the reverse order of removal.

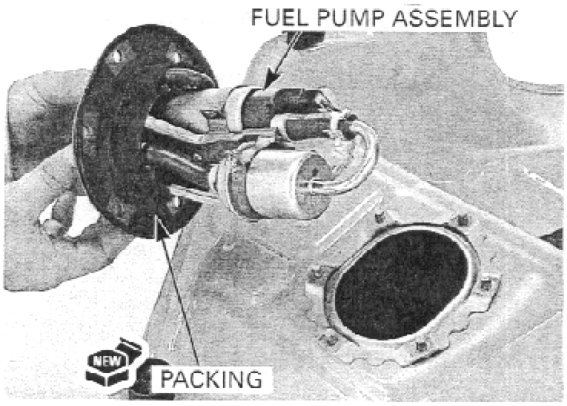


INSTALLATION

Always replace the packing with a new one.

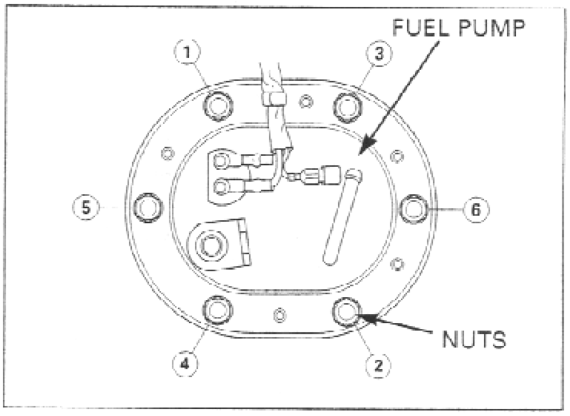
Place a new packing onto the fuel tank.

Install the fuel pump being careful not to damage the fuel pump wire.



Install and tighten the fuel pump mounting nuts in the sequence shown.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

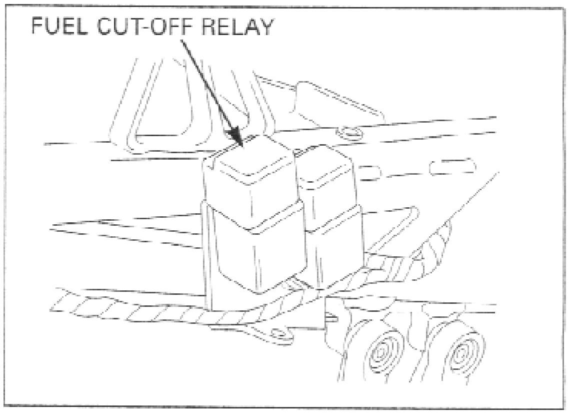


FUEL CUT RELAY

INSPECTION

Remove the rear cowl (page 2-2).

Disconnect the fuel cut-off relay 4P connector, remove the fuel cut-off relay.



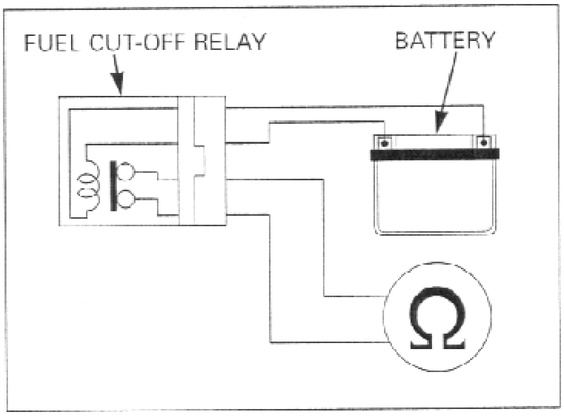
Connect the ohmmeter to the fuel cut-off relay connector terminals.

CONNECTION: Black/White – Brown

Connect the 12-V battery to the following fuel cut-off relay connector terminals.

CONNECTION: Brown/Black – Black/White

There should be continuity only when the 12-V battery is connected.
If there is no continuity when the 12-V battery is connected, replace the fuel cut-off relay.

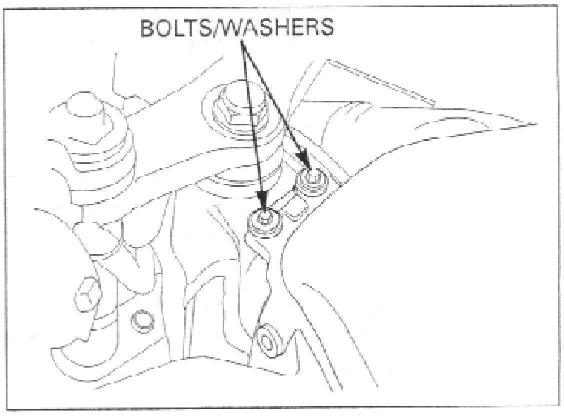


FUEL TANK

REMOVAL

Remove the air duct cover (page 2-7).

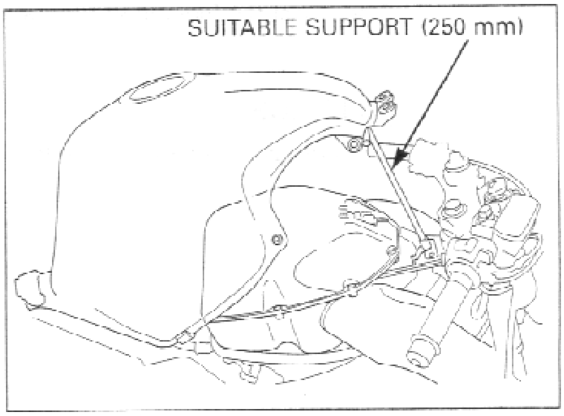
Remove the fuel tank front mounting bolts and washers.



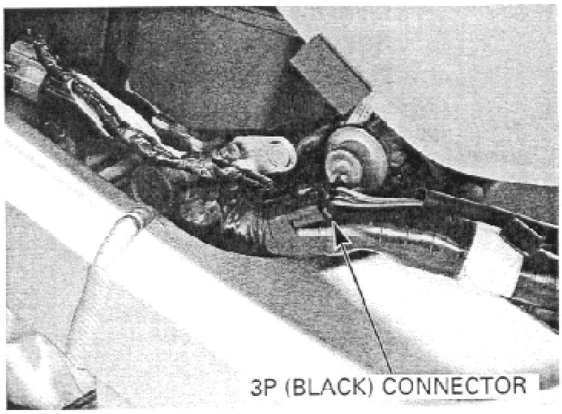
Lift the fuel tank slowly, being careful not to overextend the fuel tank.

Support the front end of fuel tank and support it using a suitable support (250 mm).

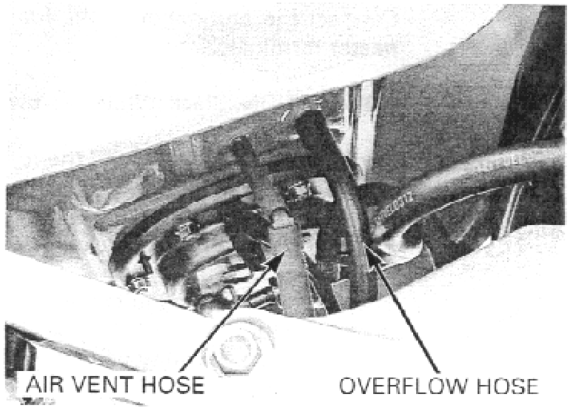
Release the fuel pressure (page 5-50).



Disconnect the fuel pump/reserve sensor 3P (Black) connector.



Disconnect the fuel tank air vent hose and overflow hose.

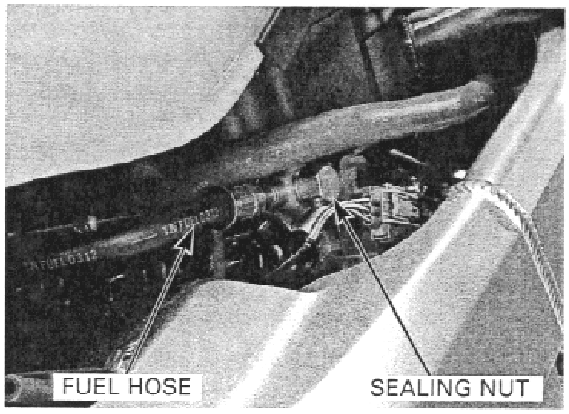


Hold the fuel pipe nut and remove the fuel hose sealing nut and sealing washers, then disconnect the fuel hose.

NOTICE

- *Do not apply excessive force to the fuel pipe.*
- *Always hold the fuel pipe nut while removing the fuel hose sealing nut.*

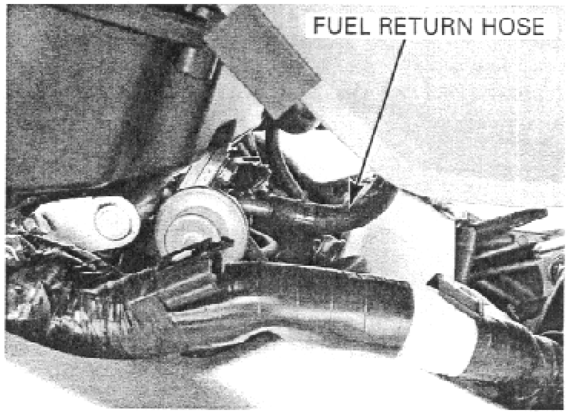
Temporarily install a 12 x 30 mm bolt (pitch 1.25) and sealing washers to the fuel hose banjo, then tighten the sealing nut.



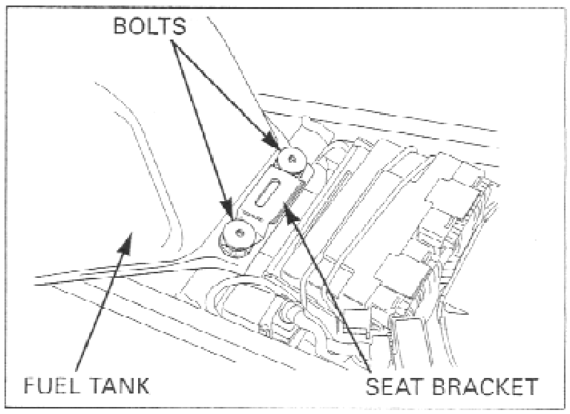
Disconnect the fuel return hose at the pressure regulator.

NOTICE

Do not apply excessive force to the fuel pipe.



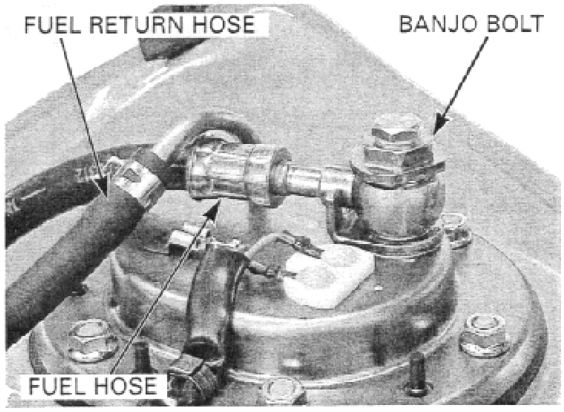
Close the fuel tank.
Remove the fuel tank rear mounting bolts, seat bracket and fuel tank.



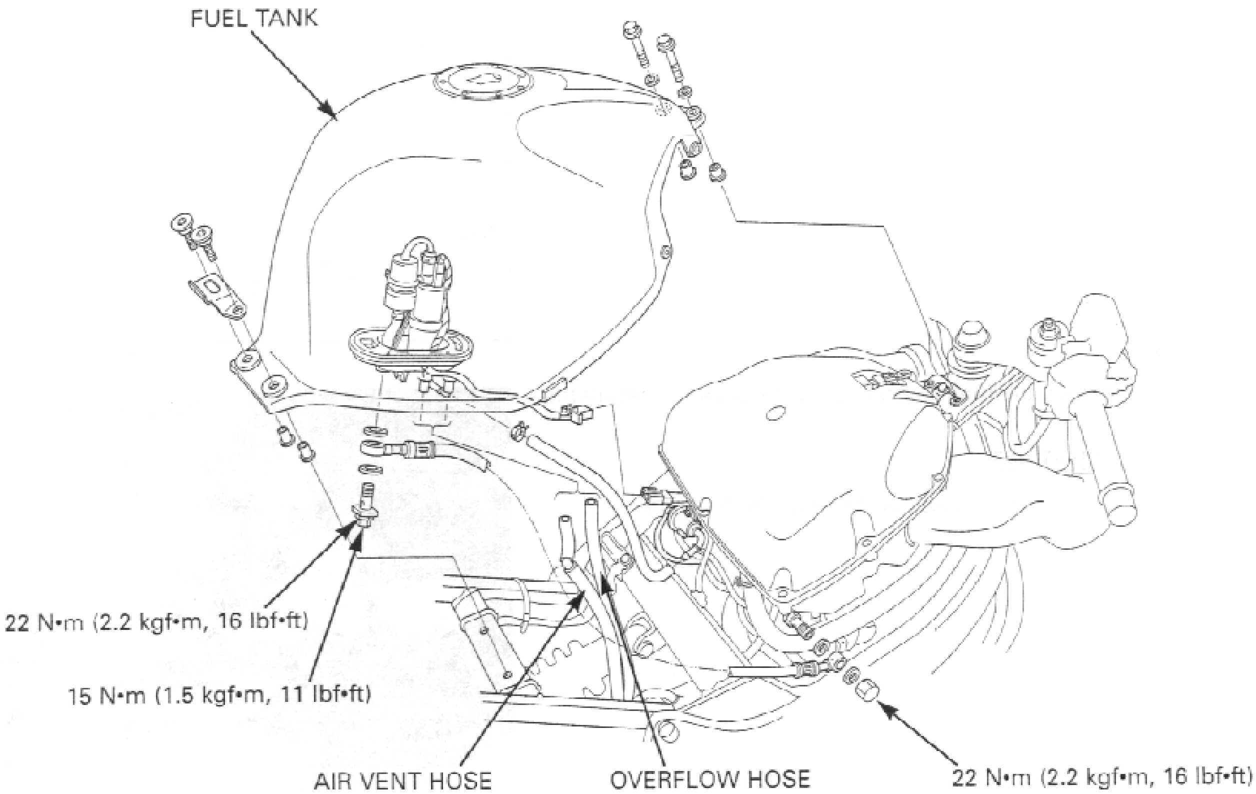
Place the fuel tank upside down.
Be careful not to damage the fuel tank.

Disconnect the fuel return hose from the fuel pump.
Remove the fuel hose banjo bolt and sealing washers, then remove the fuel hose from the fuel pump.

Refer to page 5-53 for fuel pump removal.



INSTALLATION



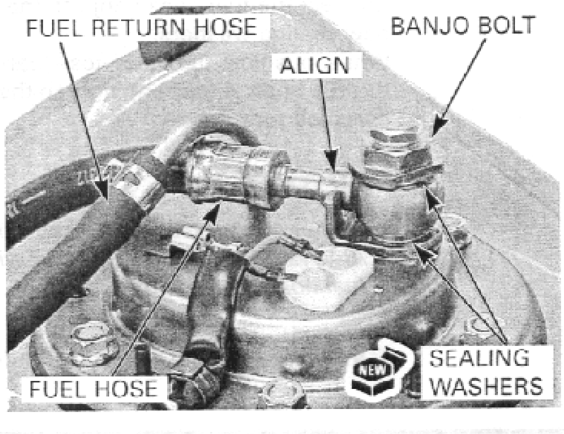
Align the fuel hose eyelet joint with the stopper on the fuel pump.

Connect the fuel hose to the fuel pump with new sealing washers.

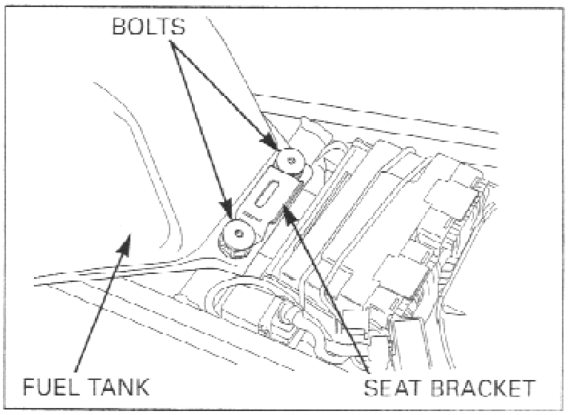
Install and tighten the fuel hose banjo bolt to the specified torque.

TORQUE: 22 N•m (2.2 kgf•m, 16 lbf•ft)

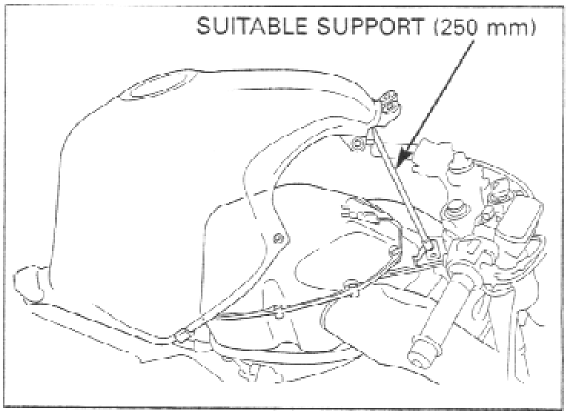
Connect the fuel return hose to the fuel pump.



Install the fuel tank onto the frame.
Install the seat bracket and fuel tank rear mounting bolts.



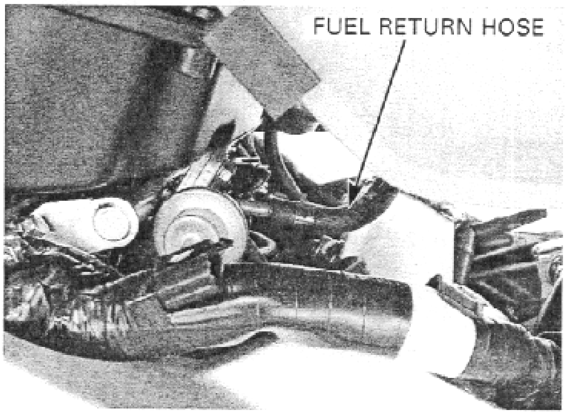
Support the front end of the fuel tank with a suitable support (250-mm).



Connect the fuel return hose to the pressure regulator.

NOTICE

Do not apply excessive force to the fuel pipe.

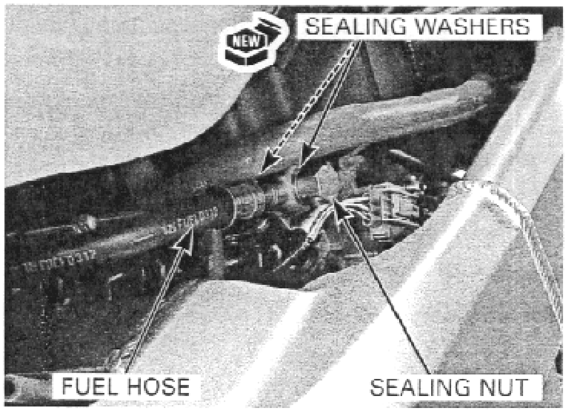


Connect the fuel hose banjo to the throttle body with new sealing washers.
While pushing the fuel hose banjo stopper to the throttle body, install and tighten the sealing nut to the specified torque.

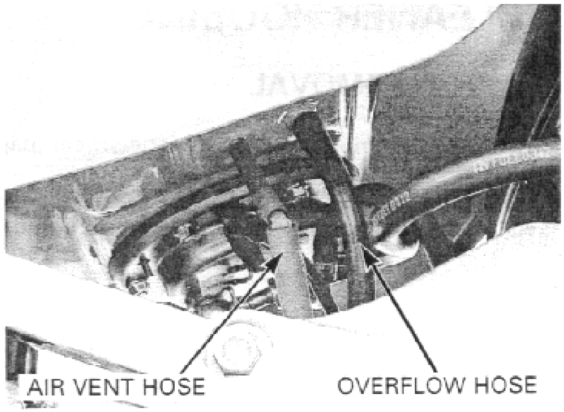
NOTICE

- *Do not apply excessive force to the fuel pipe.*
- *Always hold the fuel pipe nut while tightening the fuel hose sealing nut.*

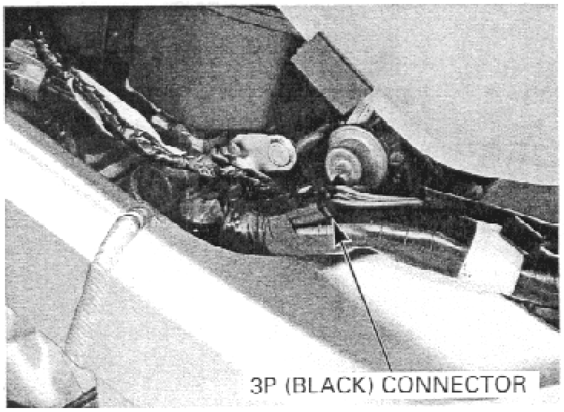
TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)



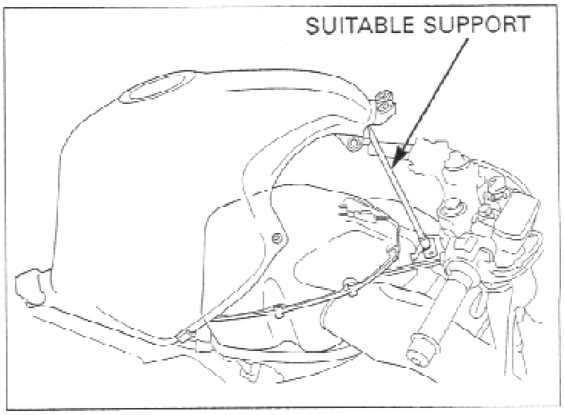
Connect the fuel tank air vent hose and overflow hose to the fuel tank.



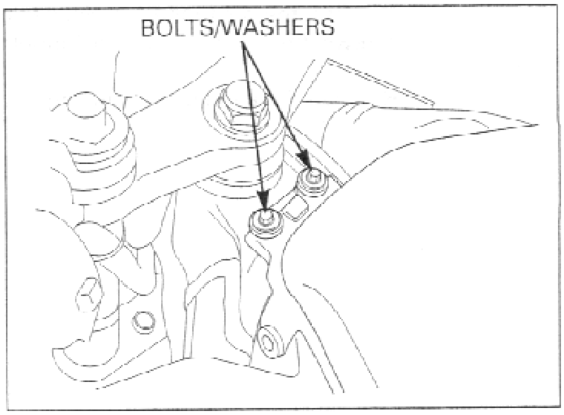
Connect the fuel pump/reserve sensor 3P (Black) connector.



Remove the support and close the fuel tank.



Install the fuel tank front mounting bolts and washers, then tighten the front and rear fuel tank mounting bolts.

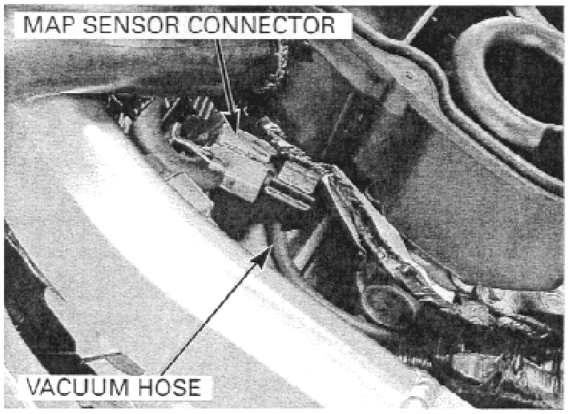


AIR CLEANER HOUSING

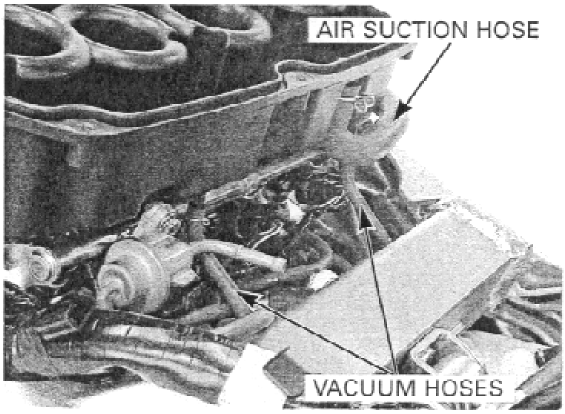
REMOVAL

Remove the air cleaner element (page 3-5).

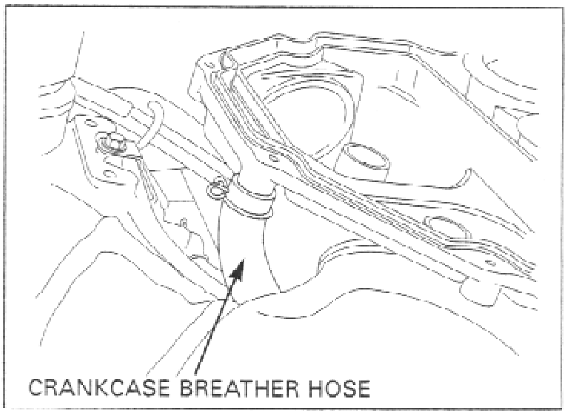
Disconnect the MAP sensor connector and vacuum hose.



Disconnect the PAIR control valve air suction hose and intake vacuum hoses from the air cleaner housing.

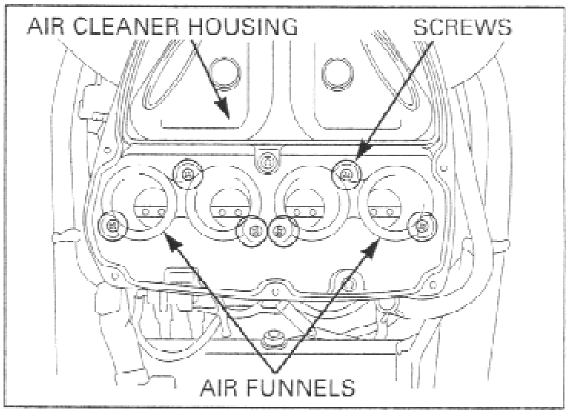


Disconnect the crankcase breather hose from the air cleaner housing.



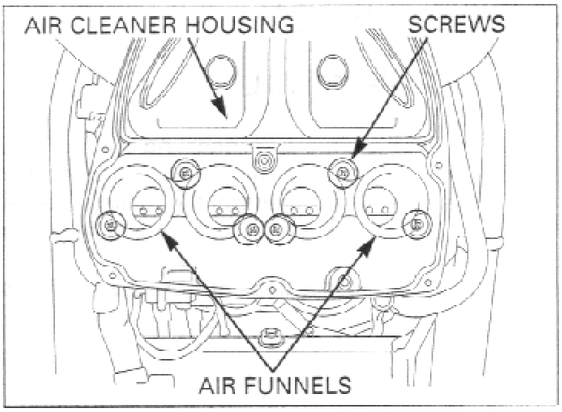
Remove the air funnel/air cleaner housing mounting screws, then remove the air funnels.

Remove the air cleaner housing.

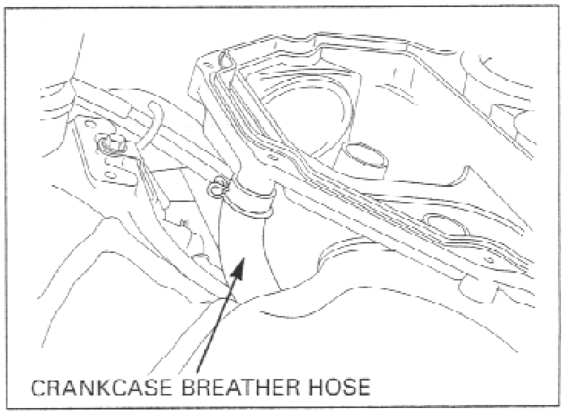


INSTALLATION

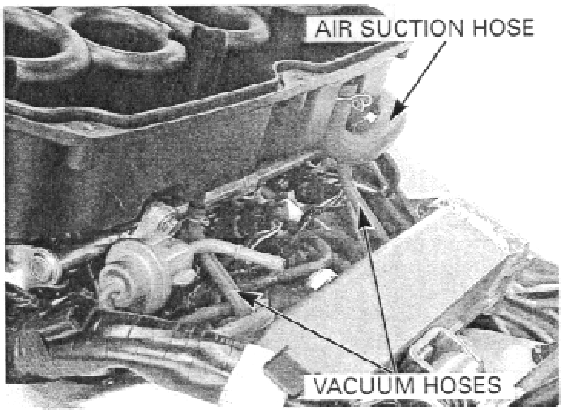
Install the air cleaner housing onto the throttle body.
Install the air funnels in their proper locations.
Install and tighten the air funnel/air cleaner housing mounting screws.



Connect the crankcase breather hose to the air cleaner housing.

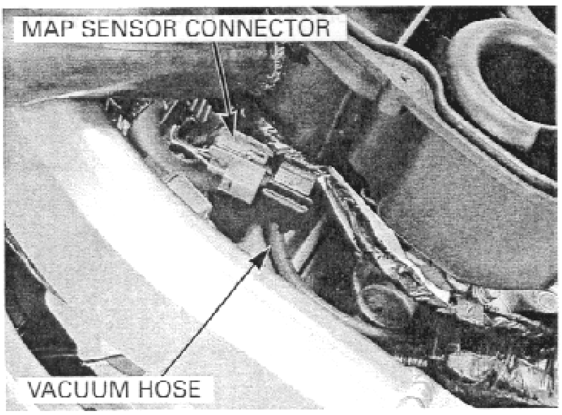


Connect the PAIR control valve air suction hose and intake vacuum hoses to the air cleaner housing.



Connect the MAP sensor connector and vacuum hose.

Install the air cleaner element (page 3-5).



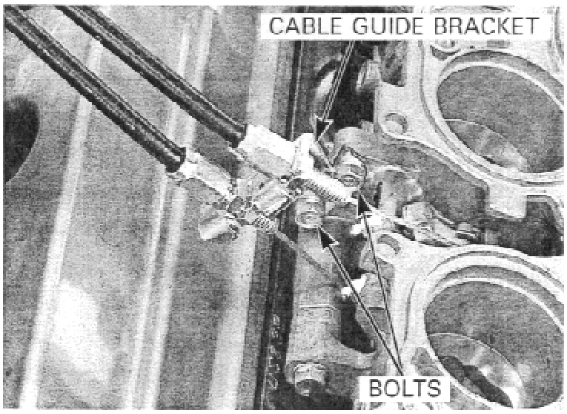
THROTTLE BODY

REMOVAL

- Before disconnecting the fuel hose, release the fuel pressure by loosening the service check bolt.
- Always replace the sealing washer when the service check bolt is removed or loosened.

Drain the coolant from the cooling system (page 6-4).

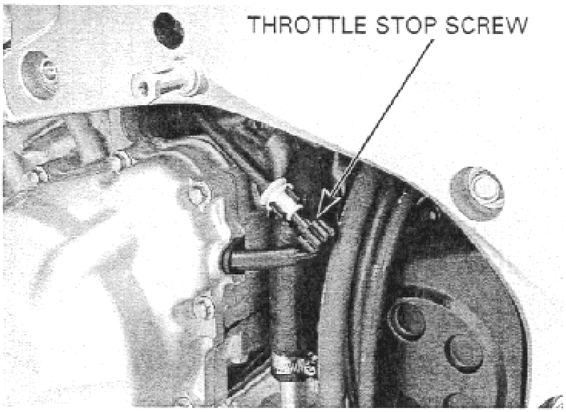
Remove the following:
– Fuel tank (page 5-55)
– Air cleaner housing (page 5-60)



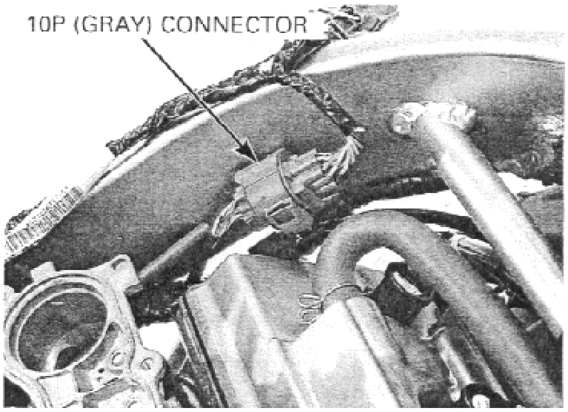
Remove the throttle cable bracket mounting bolts.
Disconnect the throttle cable ends from the throttle drum.

Do not snap the throttle valve from fully open to fully closed after the throttle cable has been removed. It may cause incorrect idle operation.

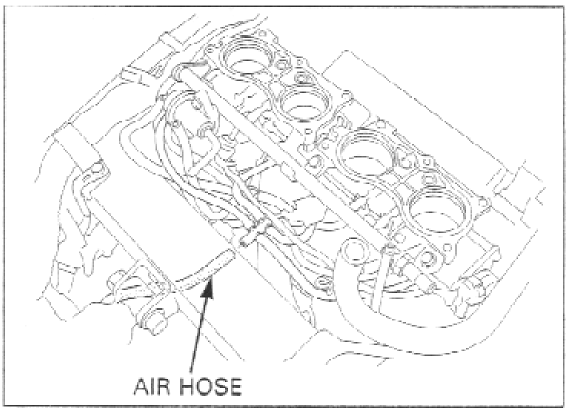
Remove the throttle stop screw knob from the clamp.



Disconnect the throttle body sub-harness 10P (Gray) connector.



California type only: Disconnect the throttle body-to-EVAP purge control solenoid valve hose.

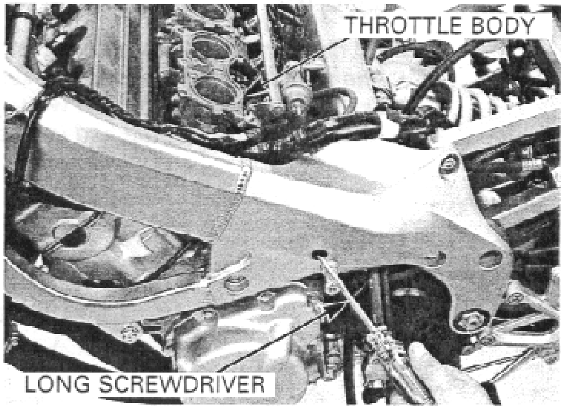


Loosen the engine side insulator band screws using a long type phillips screwdriver through the frame hole.

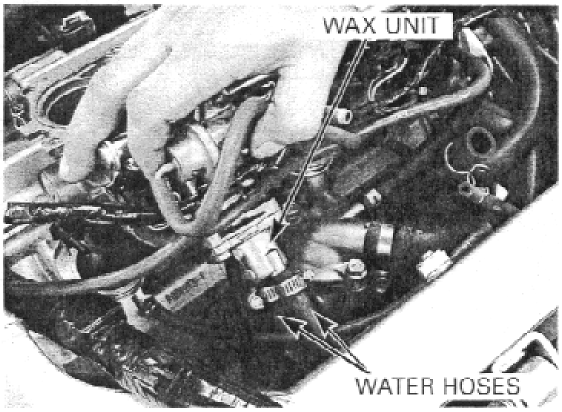
Remove the throttle body from the cylinder head.

NOTICE

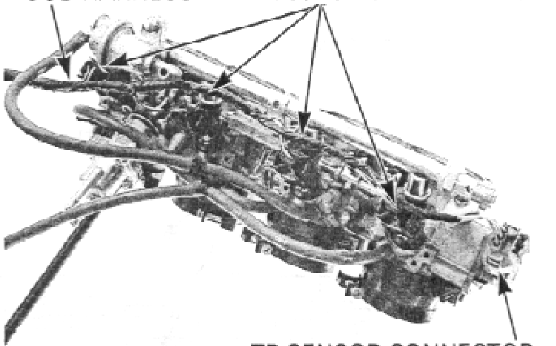
Do not hold the fuel pipe on the throttle body while removing the throttle body.



Loosen the hose band screws and disconnect the fast idle wax unit water hoses from the wax unit.
Seal the cylinder head intake ports with tape or a clean cloth to keep dirt and debris from entering the intake ports after the throttle body has been removed.

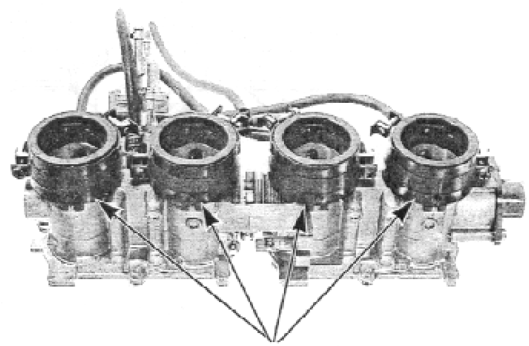


Disconnect the TP sensor connector and injector connectors, then remove the throttle body sub-harness.



Do not snap the throttle valve from fully open to fully closed after the throttle cable has been removed. It may cause incorrect idle operation.

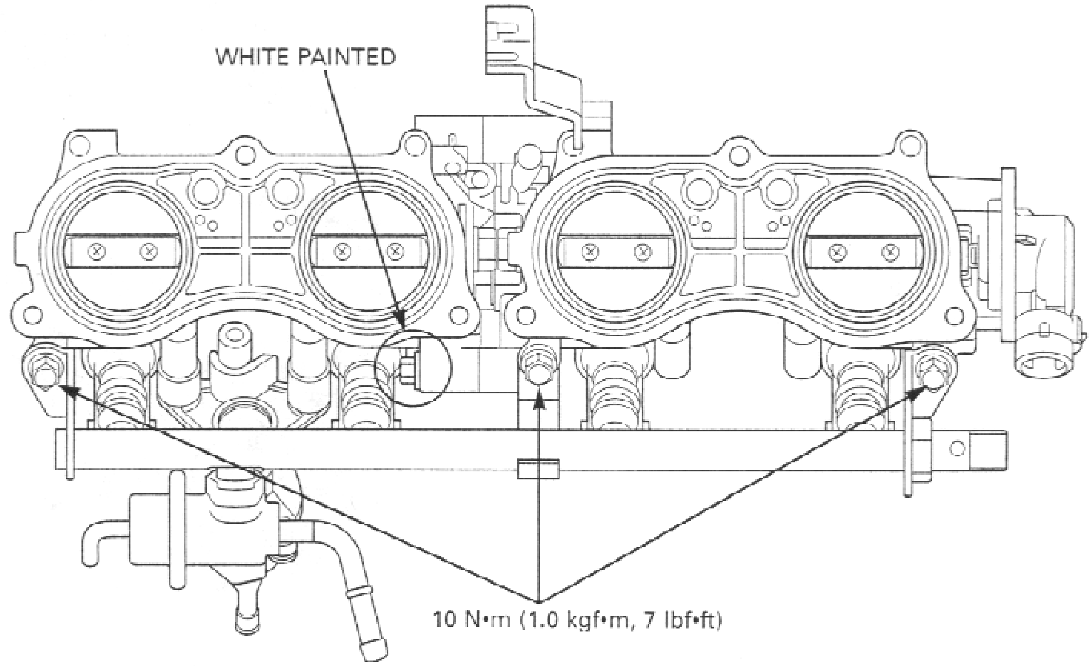
Remove the insulators from the throttle body.



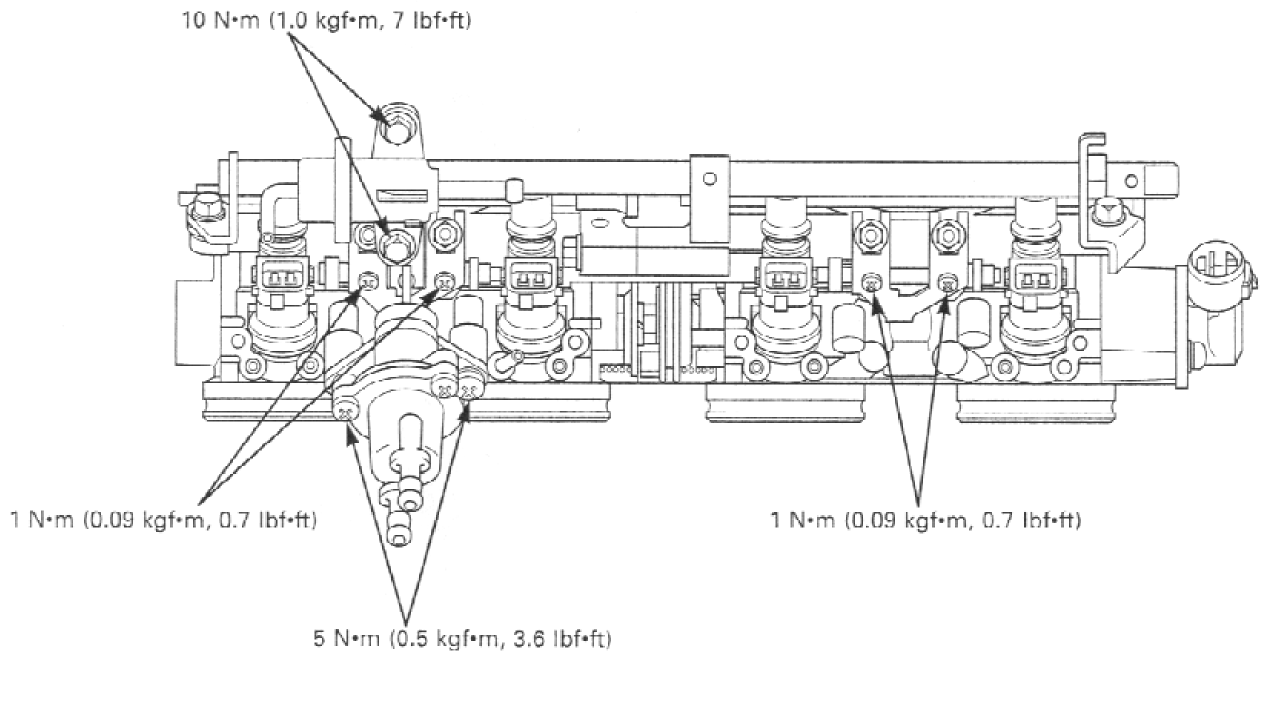
NOTICE

- *Do not damage the throttle body, this may cause incorrect throttle and idle valve synchronization.*
- *The throttle body is factory pre-set, do not disassemble it in a way other than shown in this manual.*
- *Do not loosen or tighten the white painted bolts and screws of the throttle body. Loosening or tightening them can cause throttle and idle valve synchronization failure.*

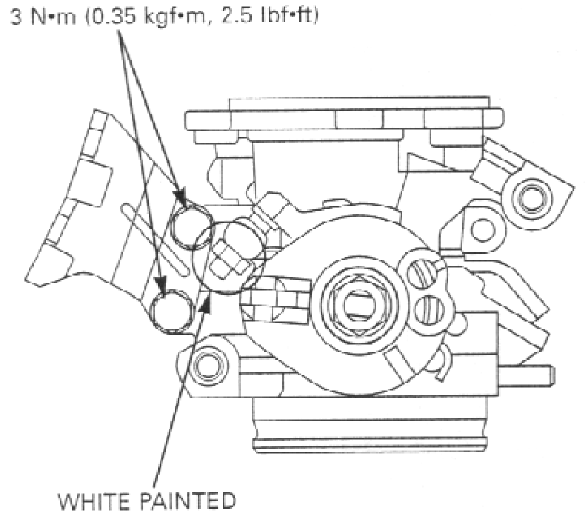
TOP VIEW:



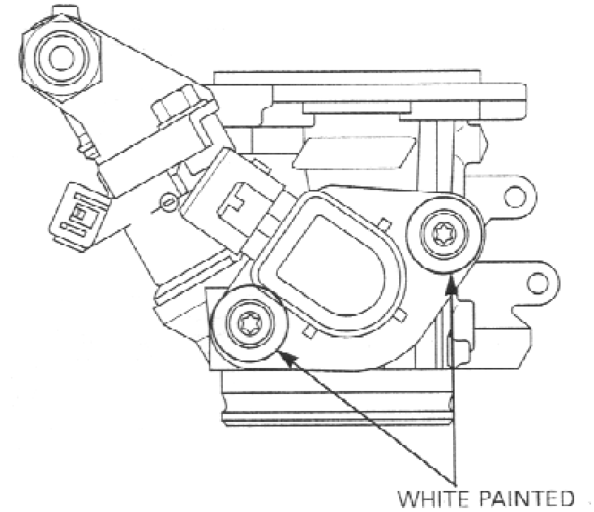
REAR VIEW:



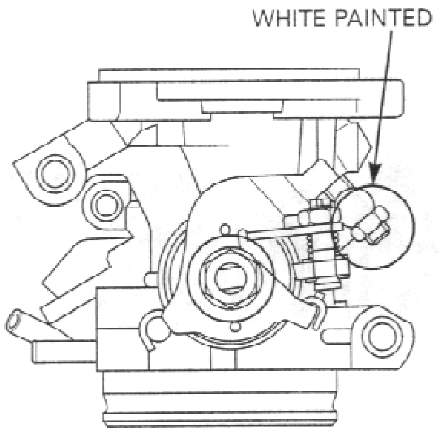
THROTTLE DRUM VIEW:



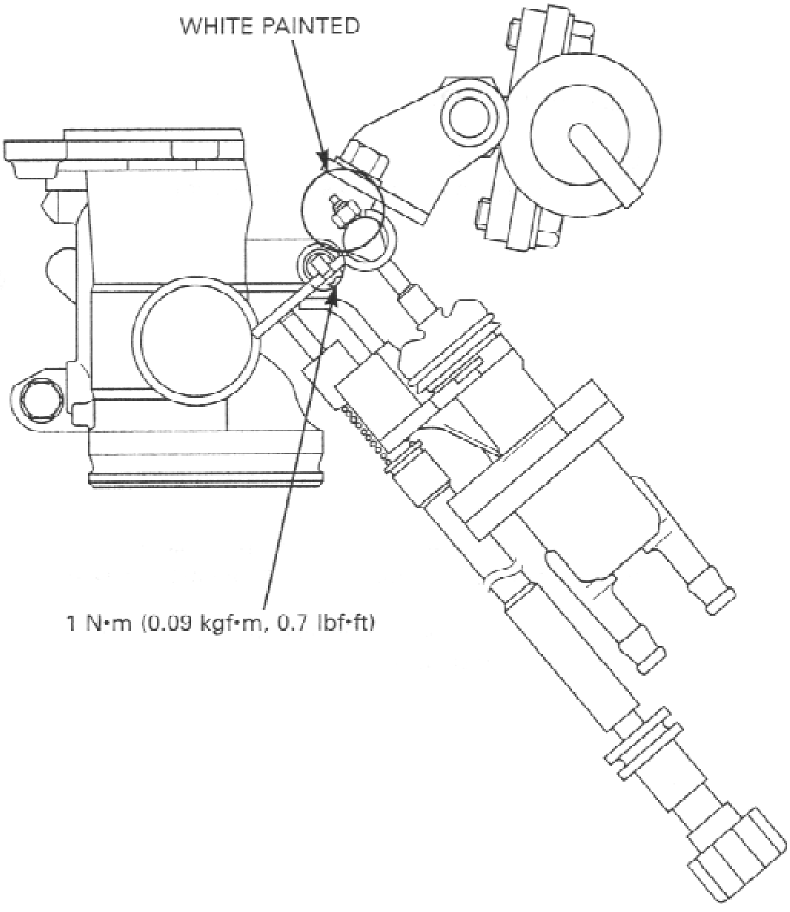
RIGHT SIDE VIEW:



THROTTLE LINK VIEW:

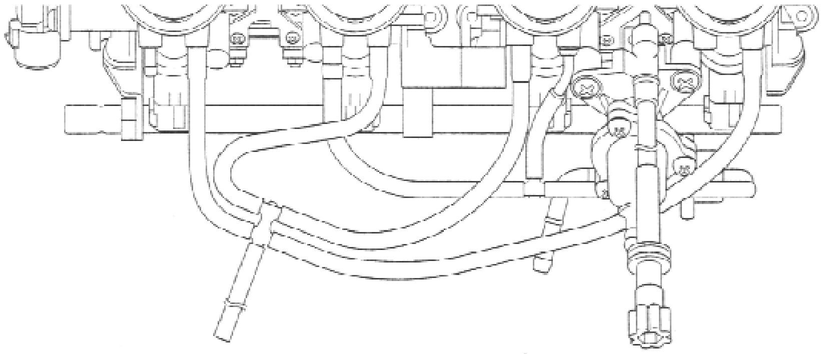


STARTER VALVE LINK VIEW:

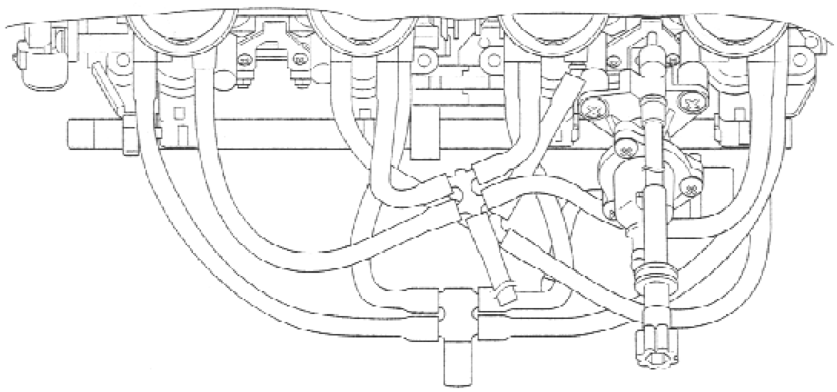


THROTTLE BODY VACUUM HOSE ROUTING

Except California type:

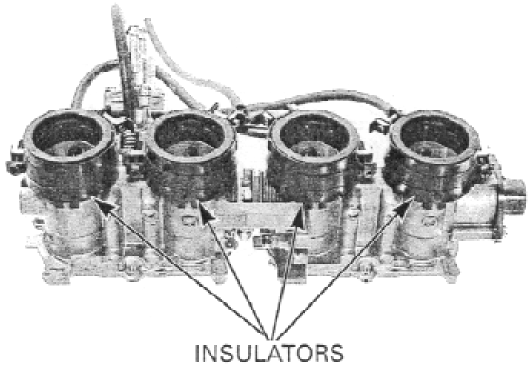


California type:



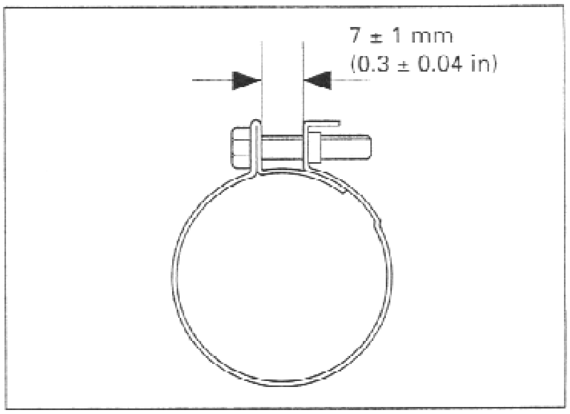
INSTALLATION

Check the insulator band angle.
Install the insulators onto the throttle body.

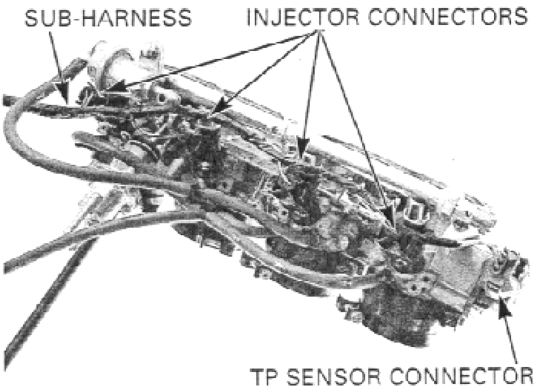


Tighten the throttle body side insulator band so that the insulator band distance is 7 ± 1 mm (0.3 ± 0.04 in).

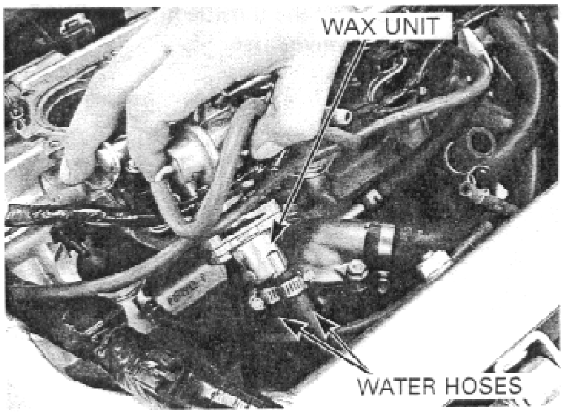
Apply oil to the insulator inside surfaces for ease of throttle body installation.



Route the throttle body sub-harness properly and connect the injector connectors and TP sensor connector.



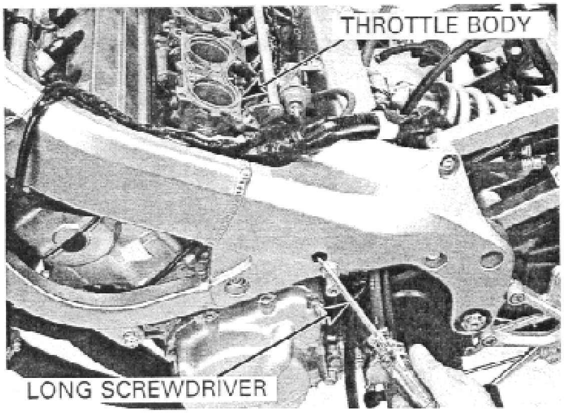
Connect the fast idle wax unit water hoses to the unit, then tighten the hose bands securely.



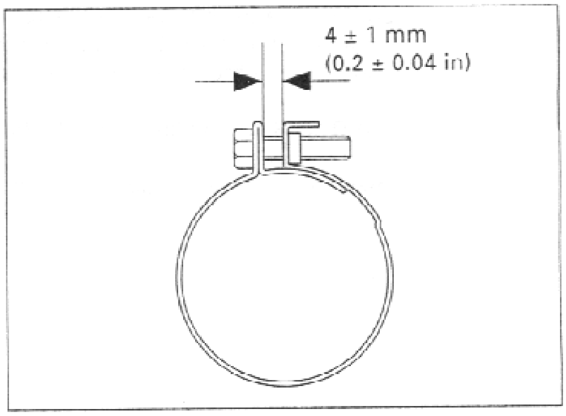
Install the throttle body onto the cylinder head.

NOTICE

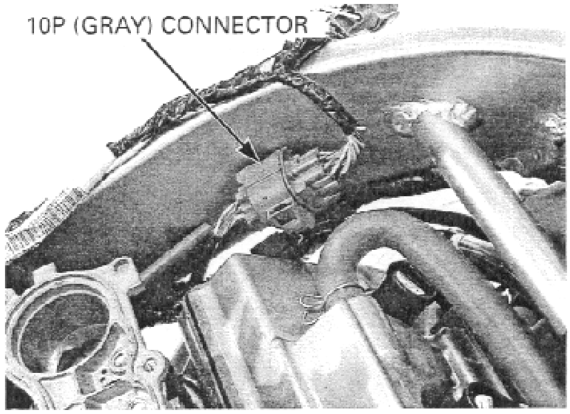
Do not hold the fuel pipe on the throttle body while installing the throttle body.



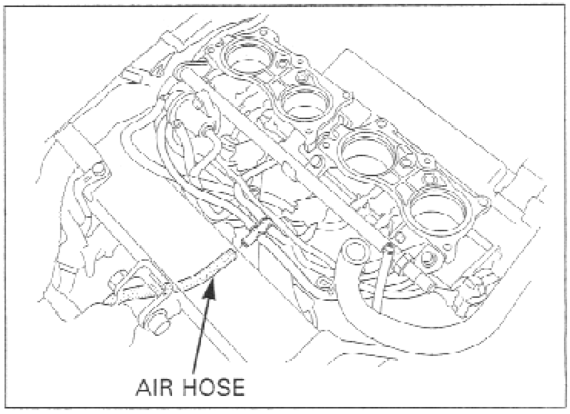
Tighten the cylinder head side insulator band so that the insulator band distance is 4 ± 1 mm (0.2 ± 0.04 in).



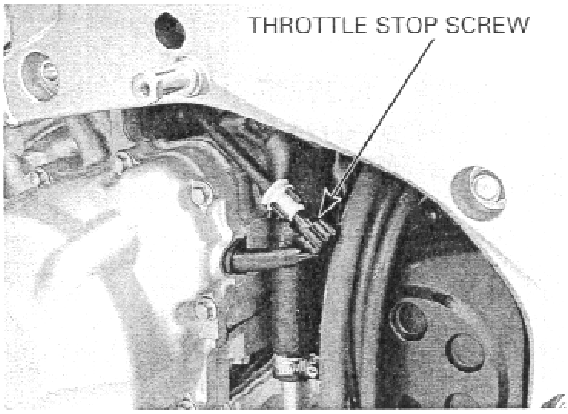
Route the injector sub-harness referring the cable and harness routing (page 1-23).
Connect the throttle body sub-harness 10P (Gray) connector.



California type only. Connect the throttle body-to-EVAP purge control solenoid valve hose.



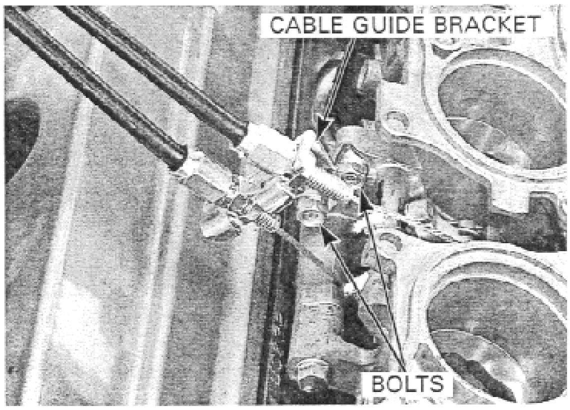
Route the throttle stop control cable properly, install the control knob to the clamp on the bypass hose.



Connect the throttle cable ends to the throttle drum.
Install the throttle cable guide bracket to the throttle body, then tighten the bolts to the specified torque.

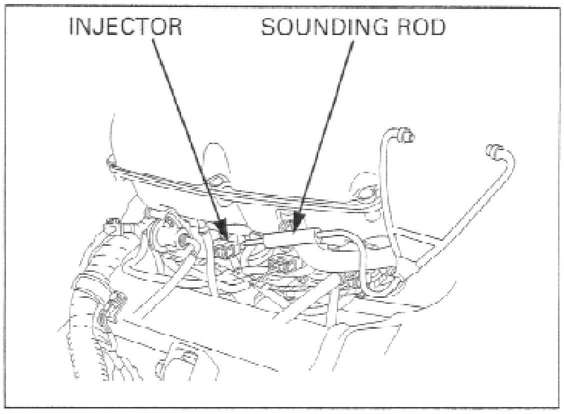
TORQUE: 3 N·m (0.35 kgf·m, 2.5 lbf·ft)

Install the removed parts in the reverse order of removal.



INJECTOR

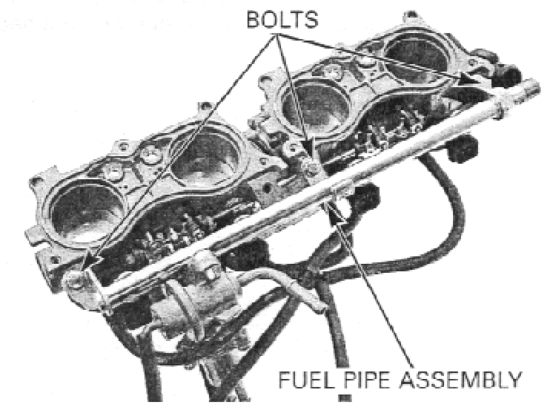
INSPECTION



Start the engine and let it idle.
Confirm proper injector operation with a sounding rod or stethoscope.

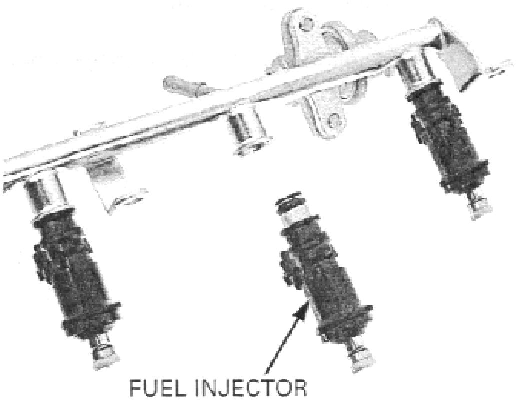
If the injector does not operate properly, replace it.

REMOVAL

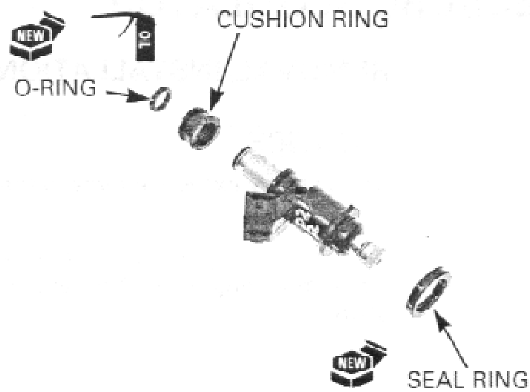


Remove the throttle body (page 5-62).

Remove the bolts and fuel pipe assembly.



Remove the injectors from the fuel pipe.



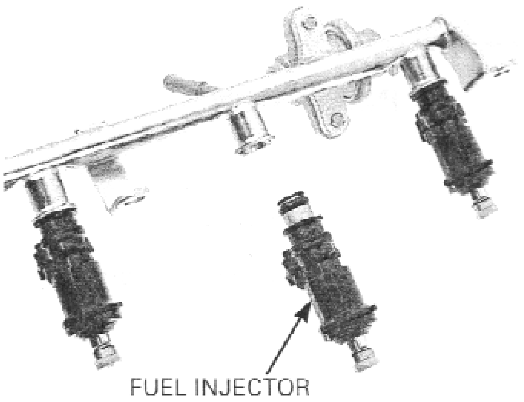
Remove the seal ring, O-ring and cushion ring.

INSTALLATION

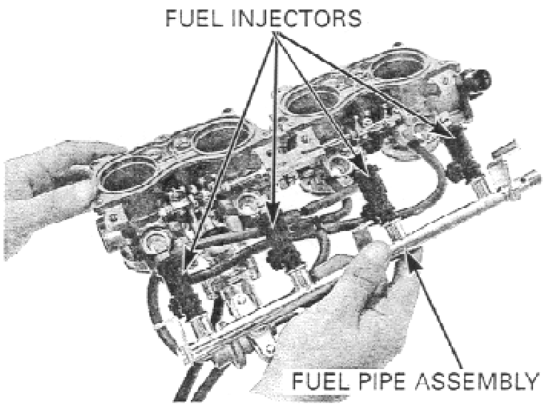
Replace the seal ring, cushion ring and O-ring with new ones as a set.

Apply oil to the new O-ring.
Install the new seal ring, cushion ring and O-ring, being careful not to damage the O-ring.

Install the fuel injectors into the fuel pipe, being careful not to damage the O-ring and cushion ring.

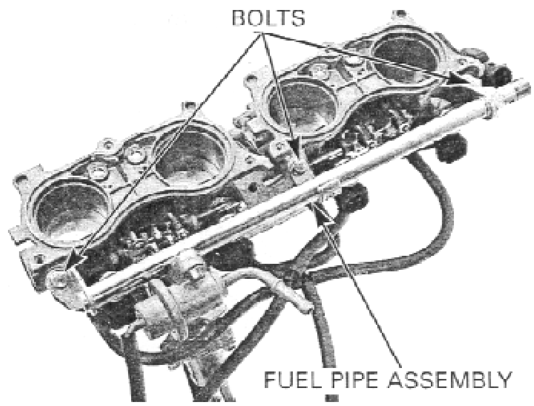


Install the fuel pipe assembly onto the throttle body, being careful not to damage the seal rings.



Install and tighten the fuel pipe mounting bolts.

Install the throttle body (page 5-66).



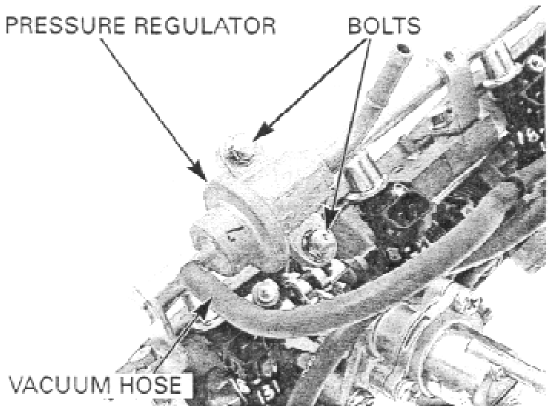
PRESSURE REGULATOR

REMOVAL/INSTALLATION

NOTICE

Do not apply excessive force to the fuel pipe.

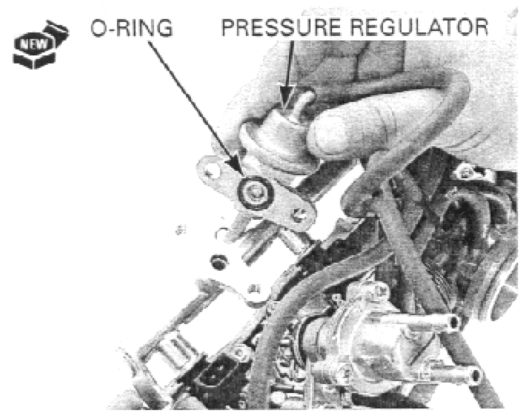
Hold the fuel pipe securely, remove the pressure regulator mounting bolts, then remove the pressure regulator.



Disconnect the vacuum hose from the pressure regulator.

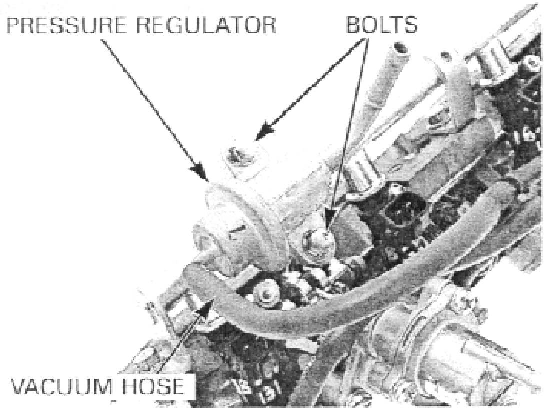
Install a new O-ring into the pressure regulator body. Install the pressure regulator onto the fuel pipe.

Connect the vacuum hose to the pressure regulator.



Hold the fuel pipe securely, tighten the pressure regulator mounting bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

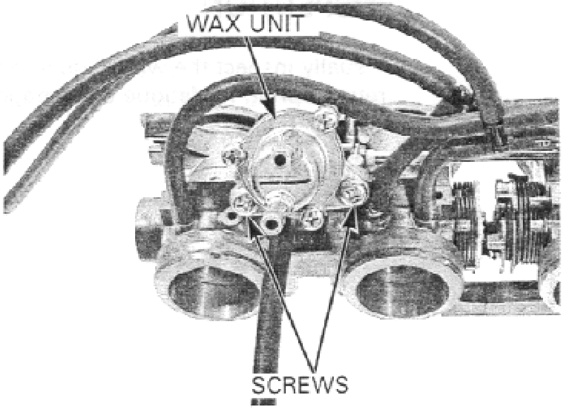


FAST IDLE WAX UNIT

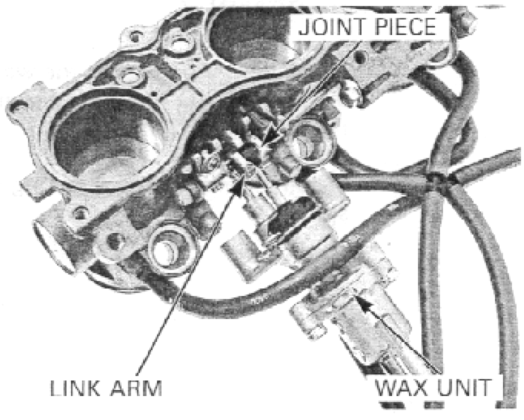
Do not loosen or remove the wax unit shaft lock nut and adjusting nut.

DISASSEMBLY

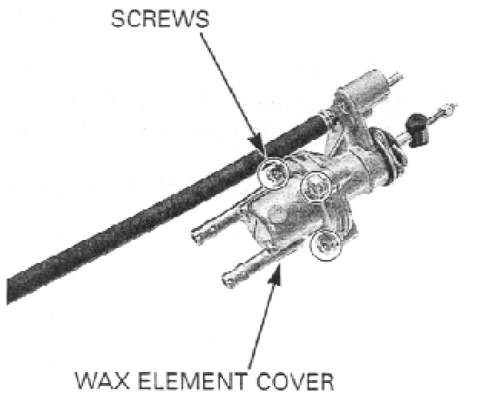
Remove the wax unit mounting screws.



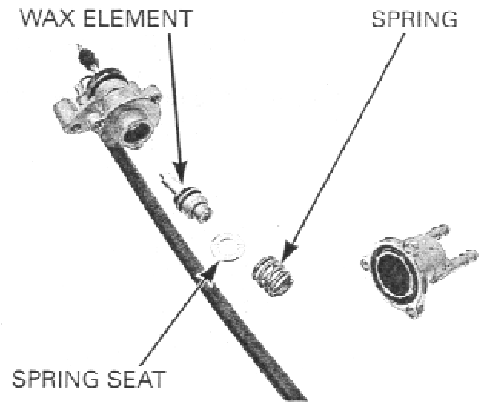
Release the wax unit shaft joint piece from the wax unit link arm, then remove the wax unit assembly.



Remove the three wax element cover mounting screws in a criss-cross pattern in two to three steps.

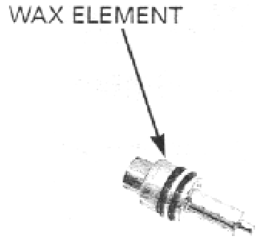


Remove the wax element, spring seat and compression spring.



INSPECTION

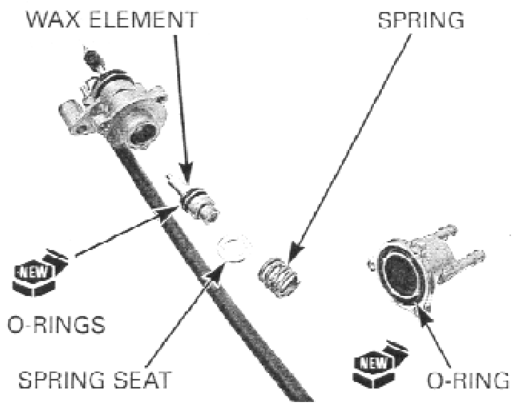
Visually inspect the wax element for damage and the return spring for fatigue or damage.



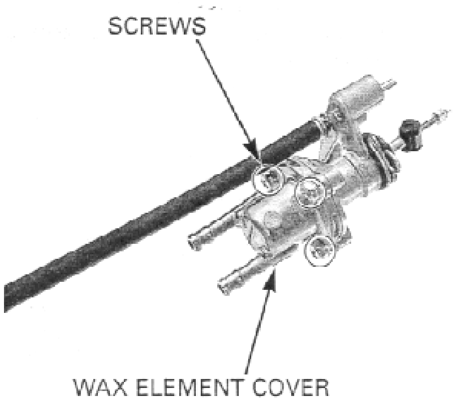
ASSEMBLY

Install new O-rings onto the wax element grooves.
Install a new O-ring into the groove of the wax element cover.

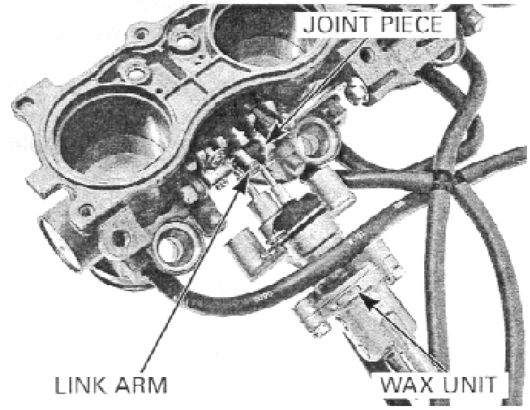
Install the wax element, spring seat and compression spring.



Install the wax element cover and mounting screws. Tighten the screws in a criss-cross pattern in two to three steps.

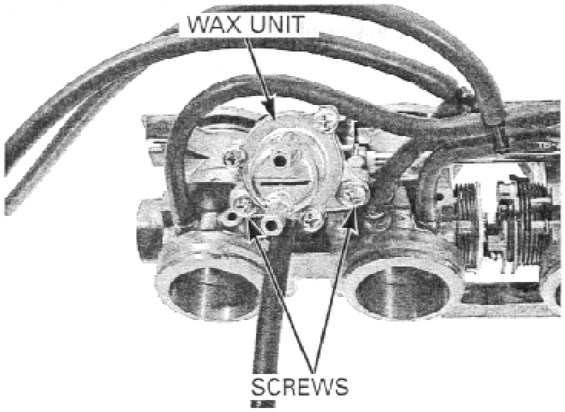


Install the wax unit shaft joint piece to the wax unit link arm.



Install and tighten the wax unit mounting screws to the specified torque.

TORQUE: 5 N·m (0.5 kgf·m, 3.6 lbf·ft)

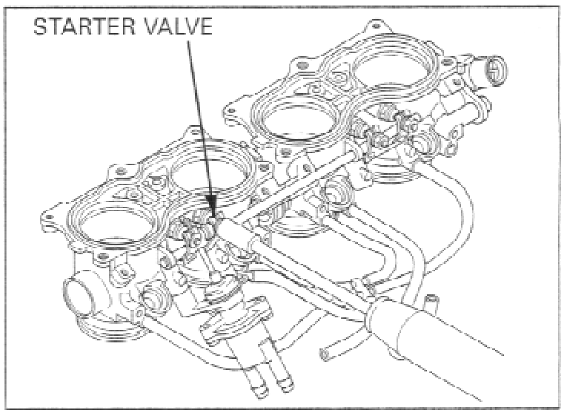


STARTER VALVE

DISASSEMBLY

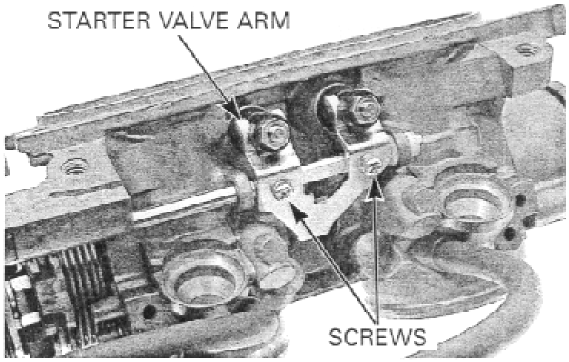
Remove the fuel pipe and injectors (page 5-69).

Turn each starter valve adjusting screw in, counting the number of turns until it seats lightly.
Record the number of turns.



No.3/4 starter valve:
Remove the starter valve arm screws and starter valve arm.

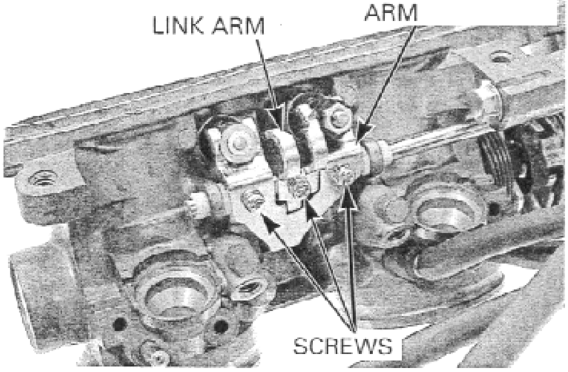
No.3/4 STARTER VALVE:



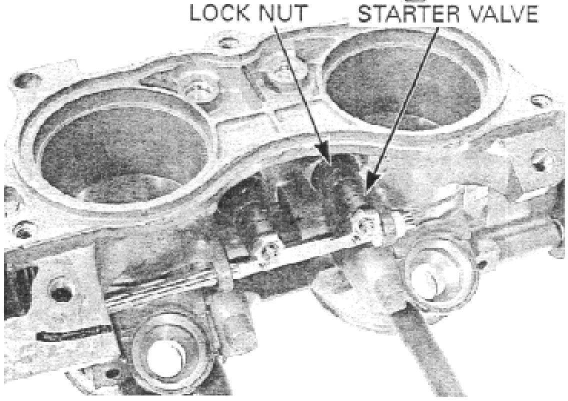
No.1/2 starter valve:
Remove the fast idle wax unit (page 5-71).

Remove the starter valve arm screws and starter valve arms.
Remove the screw and fast idle wax unit link arm.

No.1/2 STARTER VALVE:

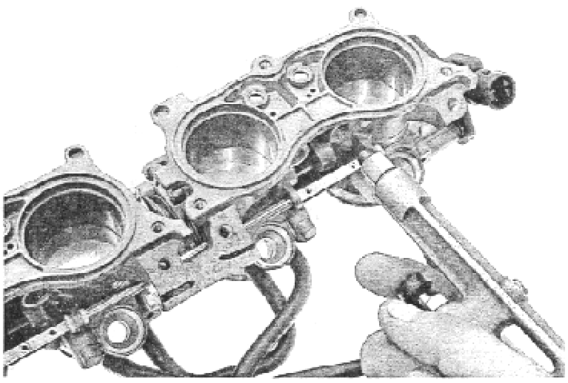


Loosen the lock nut and remove the starter valve assembly.

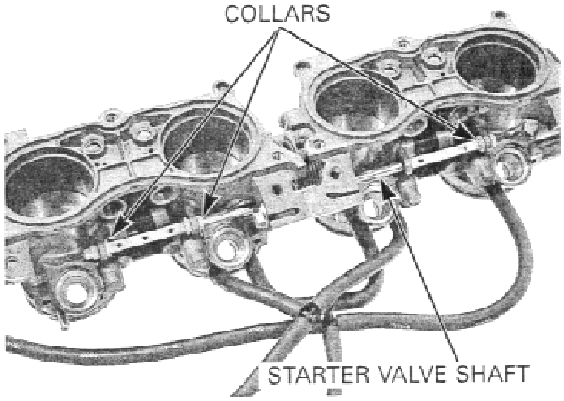


Do not apply commercially available carburetor cleaners to the inside of the throttle bore, which is coated with molybdenum.

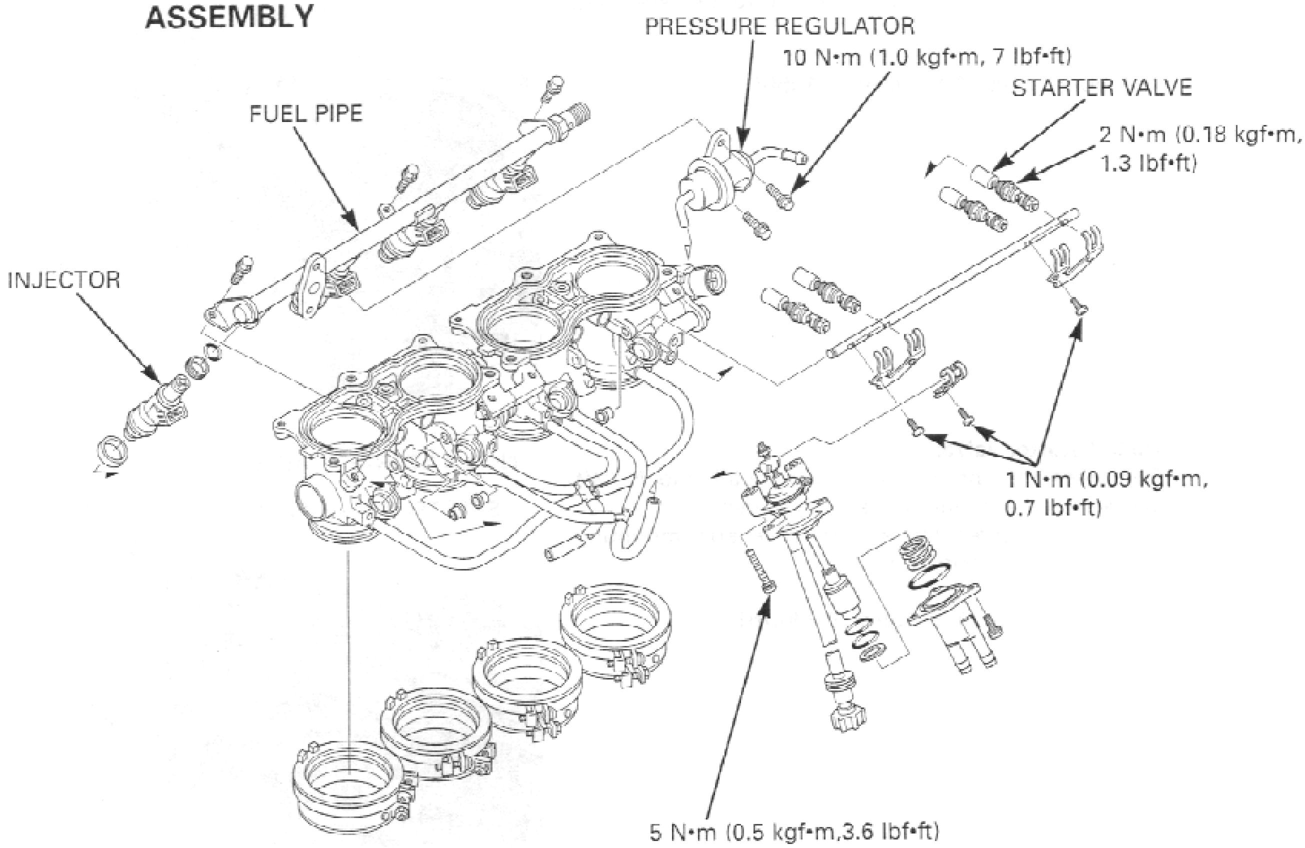
Clean the starter valve bypass using compressed air.



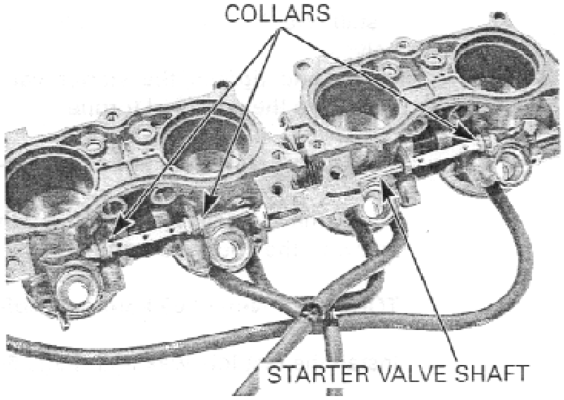
Remove the starter valve shaft and three collars.



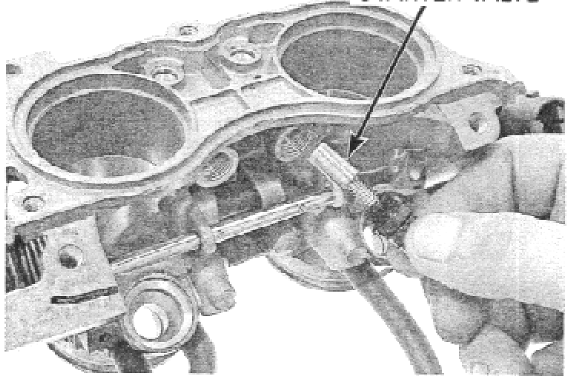
ASSEMBLY



Install the three collars and starter valve shaft.

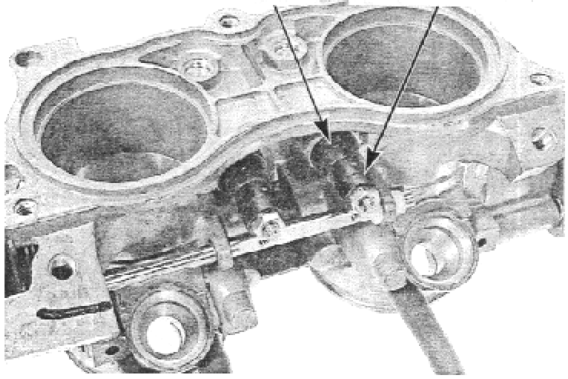


Install the starter valve assembly into the valve hole.



Tighten the starter valve lock nut to the specified torque.

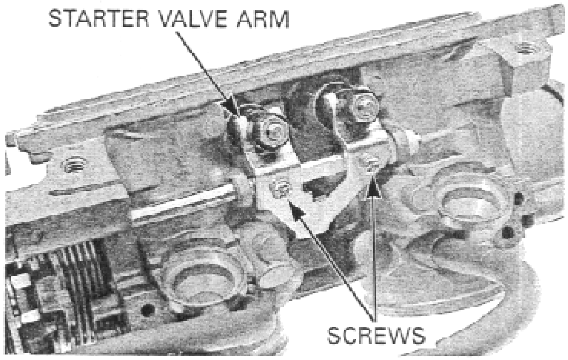
TORQUE: 2 N•m (0.18 kgf•m, 1.3 lbf•ft)



No.3/4 starter valve:
Compress the thrust spring and install the No.3/4 starter valve arm onto the starter valves.
Install and tighten the starter valve arm mounting screws to the specified torque.

TORQUE: 1 N•m (0.09 kgf•m, 0.7 lbf•ft)

No.3/4 STARTER VALVE:



No.1/2 starter valve:
Install the No.1/2 starter valve arm to the starter valves.
Install and tighten the starter valve arm mounting screws to the specified torque.

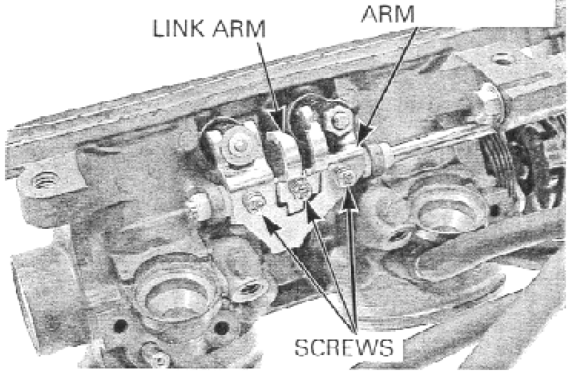
TORQUE: 1 N•m (0.09 kgf•m, 0.7 lbf•ft)

Install the fast idle wax unit link arm and tighten the screw to the specified torque.

TORQUE: 1 N•m (0.09 kgf•m, 0.7 lbf•ft)

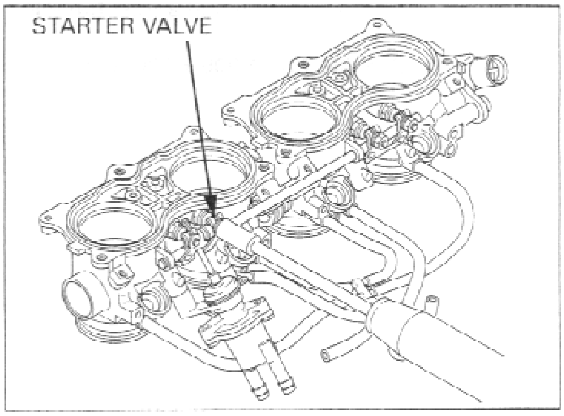
Install the fast idle wax unit (page 5-73).

No.1/2 STARTER VALVE:



Turn the starter valve screw until it seats lightly, then back it out as noted during removal.

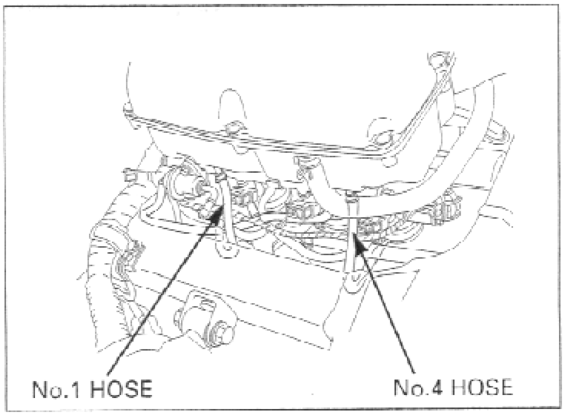
Install the throttle body (page 5-66).



STARTER VALVE SYNCHRONIZATION

- Synchronize the starter valve with the engine at the normal operating temperature and with the transmission in neutral.
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate 50 rpm change.

Support the front end of fuel tank (page 3-4).

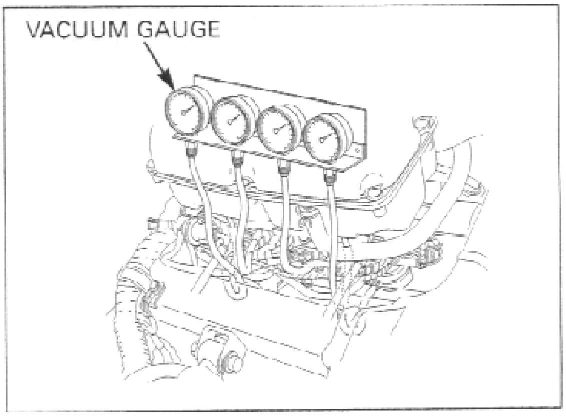


Remove the No.1 and No.4 vacuum hoses from the air cleaner housing.

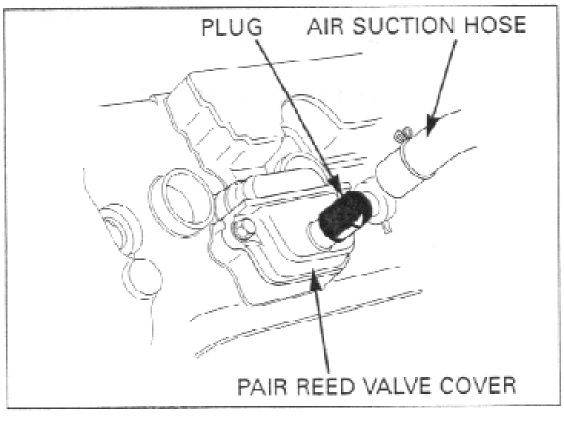
Disconnect the pressure regulator vacuum hoses at the 3-way joint.

Connect the hoses to the vacuum gauge.

Connect the tachometer.

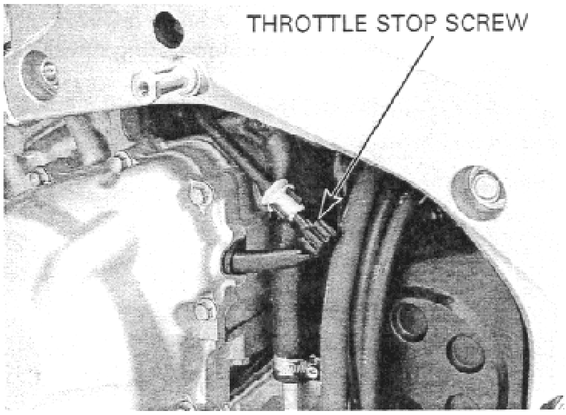


Disconnect the PAIR air suction hoses from the reed valve covers and plug the cover.



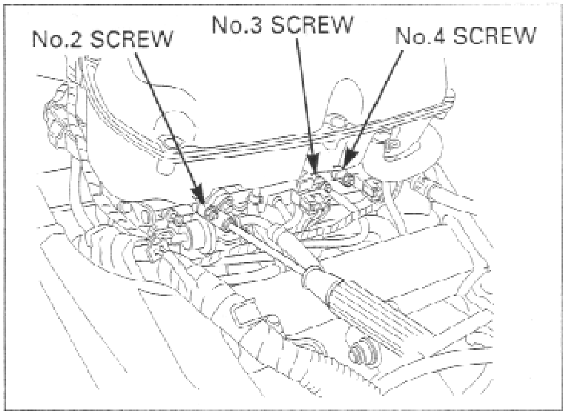
Start the engine and adjust the idle speed.

IDLE SPEED: 1,300 ± 100 rpm

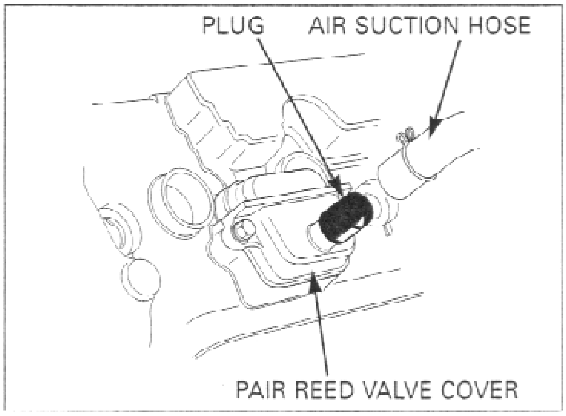


The No.1 starter valve cannot be adjusted, it is the base starter valve.

Adjust each intake vacuum pressure with the No.1 cylinder.

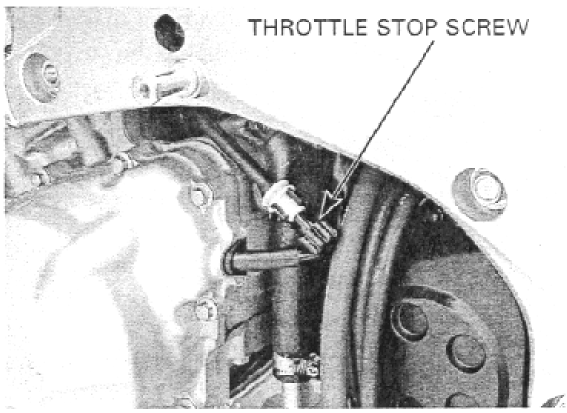


Remove the plugs and connect the PAIR air suction hoses to the reed valve covers.

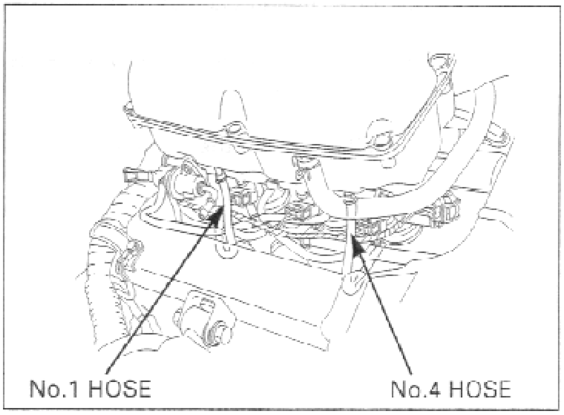


Adjust the idle speed if the idle speed differs from the specified speed.

IDLE SPEED: 1,300 ± 100 rpm



Remove the vacuum gauge from the vacuum hoses.
Connect the pressure regulator vacuum hoses to the 3-way joint.
Connect the No.1 and No.4 cylinder vacuum hose to the air cleaner housing.



MAP SENSOR

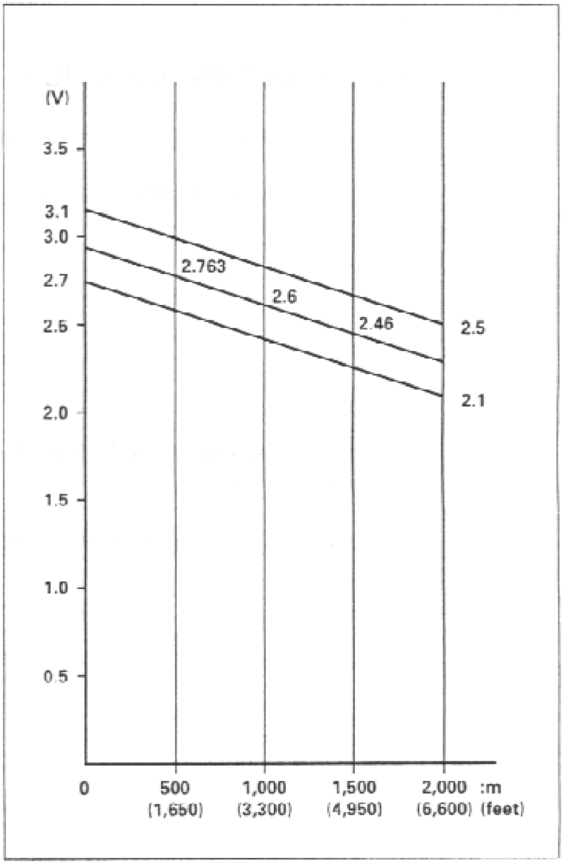
OUTPUT VOLTAGE INSPECTION

Connect the test harness to the ECM (page 5-8).

Measure the voltage at the test harness terminals (page 5-9).

CONNECTION: B7 (+) – B1 (–)
STANDARD: 2.7 – 3.1 V

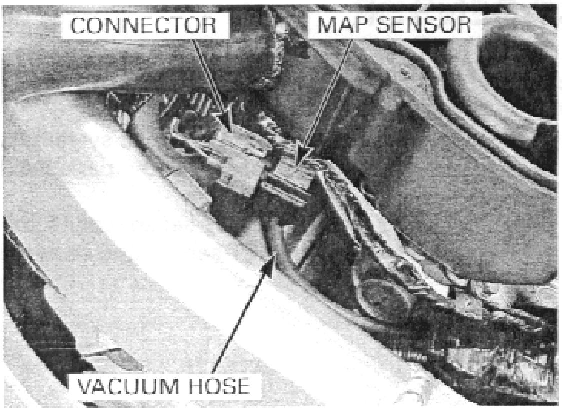
The MAP sensor output voltage (above) is measured under the standard atmosphere (1 atm = 1,030 hPa). The MAP sensor output voltage is affected by the distance above sea level, because the output voltage is changed by atmosphere.
Check the sea level measurement and be sure that the measured voltage falls within the specified value.



MAP SENSOR REMOVAL/INSTALLATION

Support the front end of fuel tank (page 3-4).

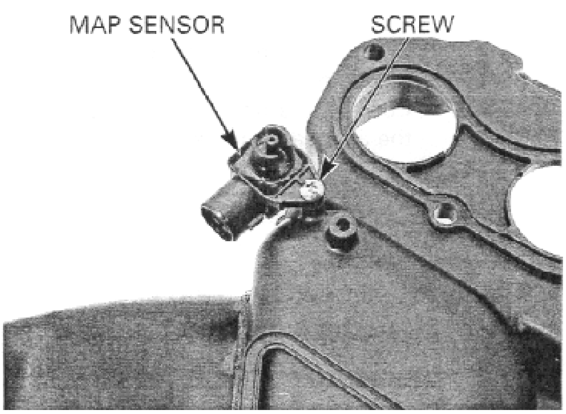
Disconnect the MAP sensor connector.
Disconnect the vacuum hose from the MAP sensor.



Remove the air cleaner housing (page 5-60).

Remove the screw and MAP sensor from the air cleaner housing.

Installation is in the reverse order of removal.

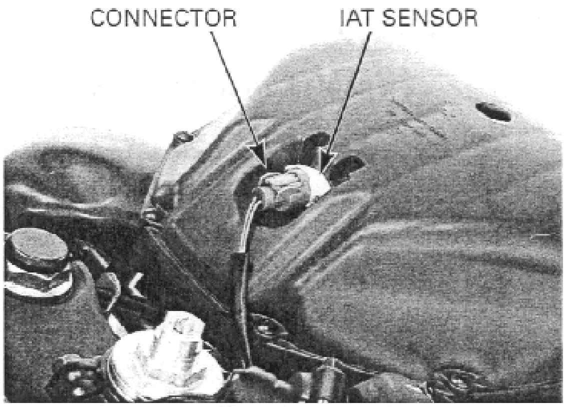


IAT SENSOR

REMOVAL/INSTALLATION

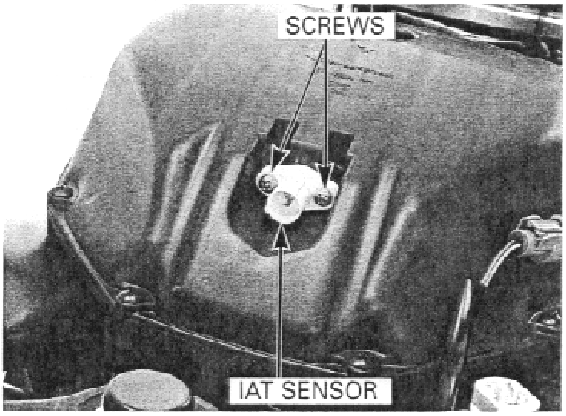
Support the front end of fuel tank (page 3-4).

Disconnect the IAT sensor connector.



Remove the screws and IAT sensor from the air cleaner housing cover.

Installation is in the reverse order of removal.



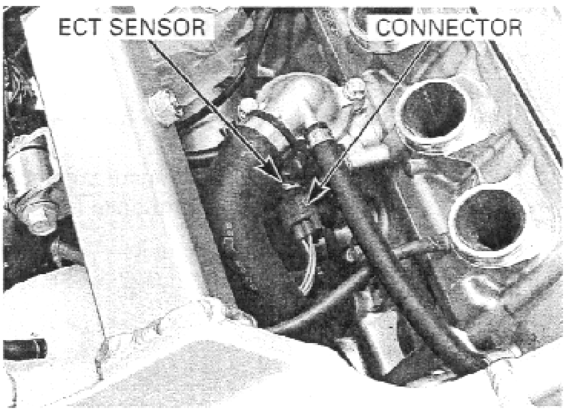
ECT SENSOR

REMOVAL/INSTALLATION

Replace the ECT sensor while the engine is cold.

Drain the coolant from the system (page 6-5).
Remove the throttle body (page 5-62).

Disconnect the ECT sensor connector from the sensor.
Remove the ECT sensor and sealing washer.



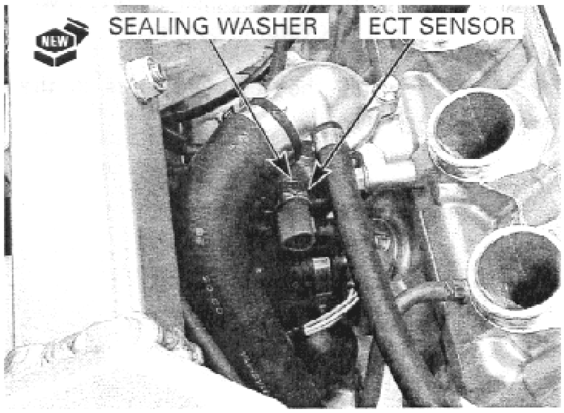
Always replace a sealing washer with a new one.

Install the new sealing washer and ECT sensor. Tighten the ECT sensor to the specified torque.

TORQUE: 23 N•m (2.3 kgf•m, 17 lbf•ft)

Connect the ECT sensor connector.

Fill the cooling system with the recommended coolant (page 6-5).

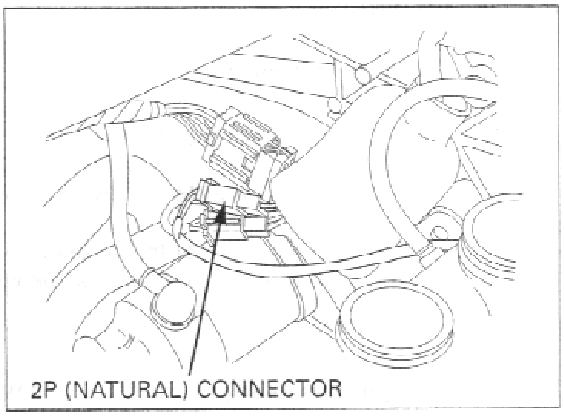


CAM PULSE GENERATOR

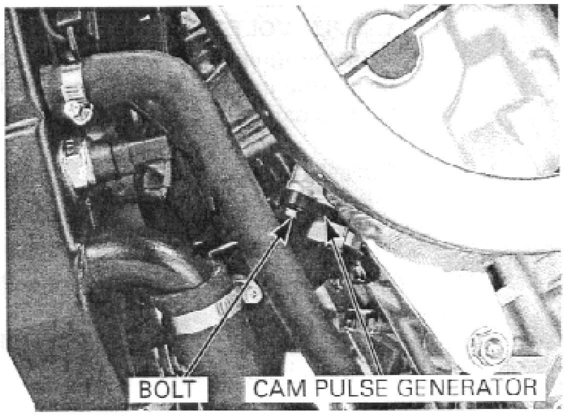
REMOVAL/INSTALLATION

Remove the air cleaner housing (page 5-60).

Disconnect the cam pulse generator 2P (Natural) connector.

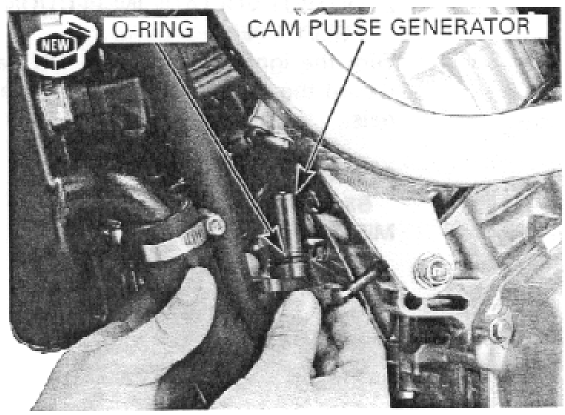


Remove the bolt and cam pulse generator from the cylinder head.



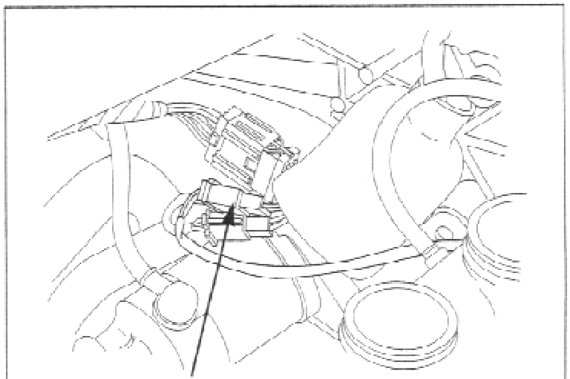
Install the new O-ring onto the cam pulse generator. Install the cam pulse generator into the cylinder head.

Install and tighten the mounting bolt securely.



Route the cam pulse generator wire properly, connect the 2P (Natural) connector.

Install the removed parts in the reverse order of removal.

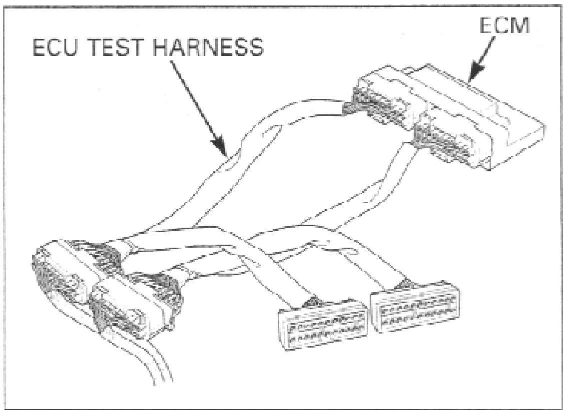

2P (NATURAL) CONNECTOR

TP SENSOR

INSPECTION

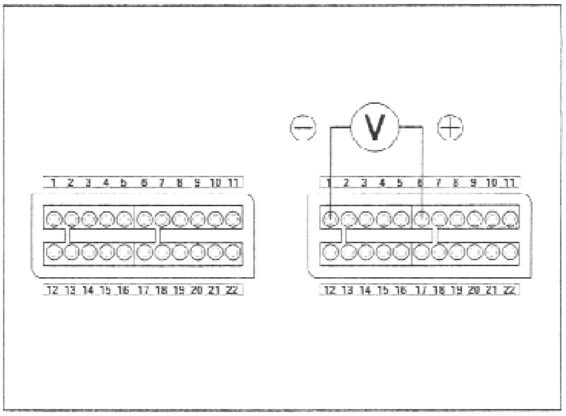
Remove the rear cowl (page 2-2).

Disconnect the ECM 22P (Black) and 22P (Light gray) connectors.
Check the connector for loose or corroded terminals.
Connect the ECU test harness between the ECM and main wire harness.



TOOL:
ECU test harness **07YMZ-0010100 (two required)**

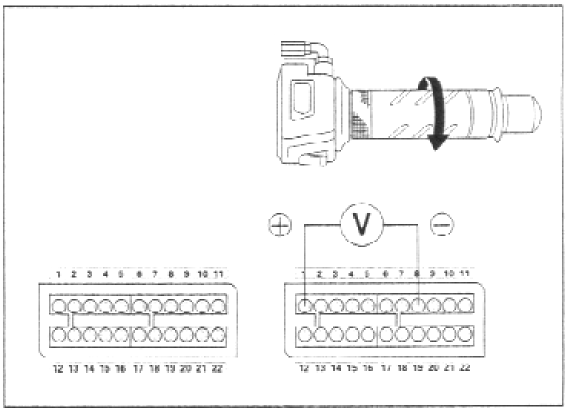
1. INPUT VOLTAGE INSPECTION
Turn the ignition switch to "ON" and measure and record the input voltage at the test harness terminals using a digital multimeter.



CONNECTION:
B5 (+) – B1 (–)
Standard: 4.5 – 5.5 V

If the measurement is out of specification, check the following:
- Loose connection of the ECM multi-connector
- Open circuit in wire harness

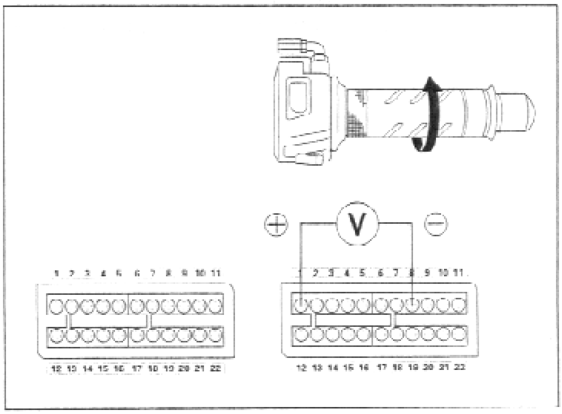
2. OUTPUT VOLTAGE INSPECTION WITH THROTTLE FULLY OPEN
Turn the ignition switch to "ON" and measure and record the output voltage at the test harness terminals.



CONNECTION:
B8 (+) – B1 (–)
MEASURING CONDITION:
At throttle fully open

3. OUTPUT VOLTAGE INSPECTION WITH THROTTLE FULLY CLOSED

Turn the ignition switch to "ON" and measure and record the output voltage with the throttle fully closed.



CONNECTION:
B8 (+) – B1 (–)
MEASURING CONDITION:
At throttle fully closed

4. CALCULATE RESULT COMPARISON

Compare the measurement to the result of the following calculation.

With the throttle fully open:
Measured input voltage x 0.824= Vo

The sensor is normal if the measurement output voltage measured in step 2 is within 10% of Vo.

With the throttle fully closed:
Measured input voltage x 0.1 = Vc

The sensor is normal if the throttle closed output voltage measured in step 3 is within 10% of Vc.

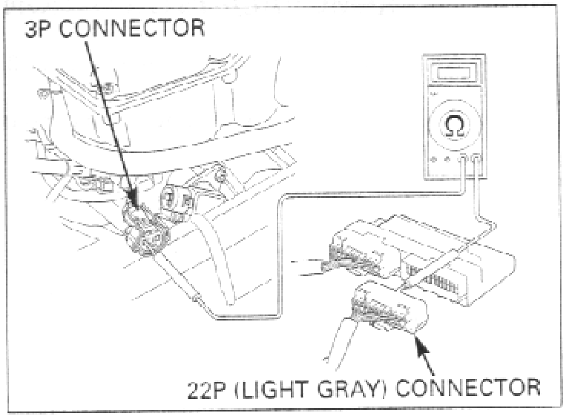
Using an analog meter, check that the needle of the voltmeter swings slowly when the throttle is opened gradually.

CONTINUITY INSPECTION

Support the front end of fuel tank (page 3-4).

Disconnect the ECM 22P (Light gray) connector and the TP sensor 3P connector.
Check for continuity between the ECM and TP sensor.

If there is no continuity, check for an open or short circuit in the wire harness.



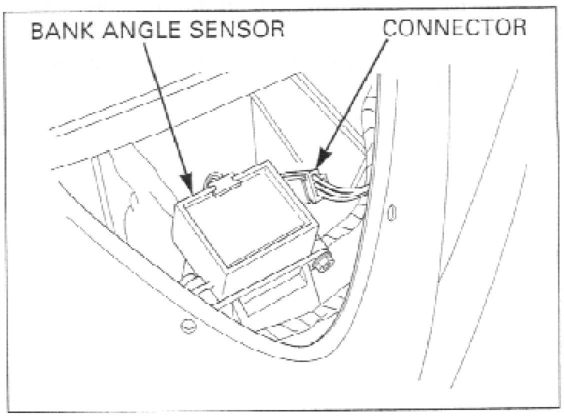
BANK ANGLE SENSOR

INSPECTION

Support the motorcycle level surface.
Remove the windscreen (page 2-7).

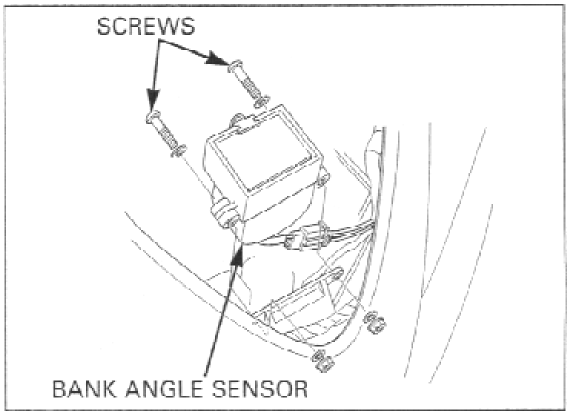
Turn the ignition switch to "ON" and measure the voltage between the following terminals of the bank angle sensor connector with the connector connected.

TERMINAL	STANDARD
White/Black (+) – Green (–)	Battery voltage
Red/White (+) – Green (–)	0 – 1 V



Do not disconnect the bank angle sensor connector during inspection.

Turn the ignition switch to "OFF".
Remove the screws and bank angle sensor.

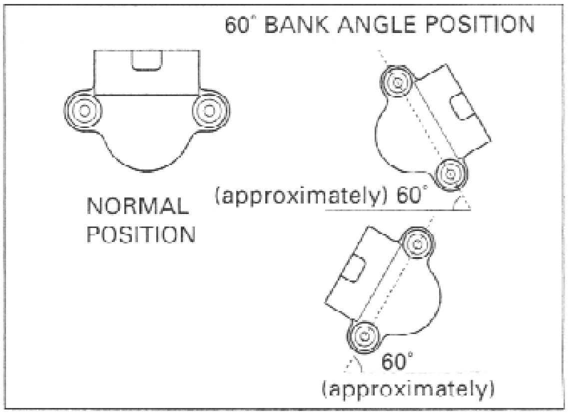


Place the bank angle sensor horizontal as shown, and turn the ignition switch to "ON".

The bank angle sensor is normal if the engine stop relay clicks and power supply is closed.

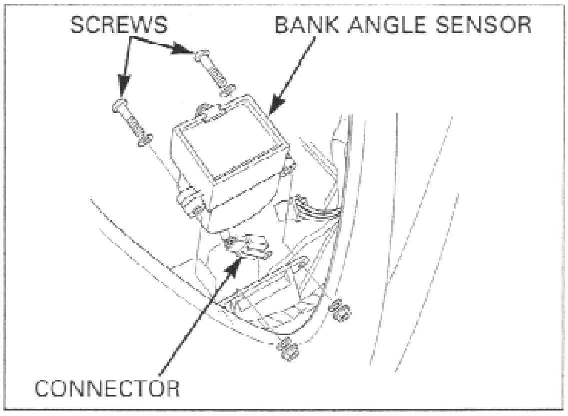
Incline the bank angle sensor approximately 60 degrees to the left or right with the ignition switch turned to "ON".
The bank angle sensor is normal if the engine stop relay clicks and power supply is open.

If you repeat this test, first turn the ignition switch to "OFF", then turn the ignition switch to "ON".



REMOVAL/INSTALLATION

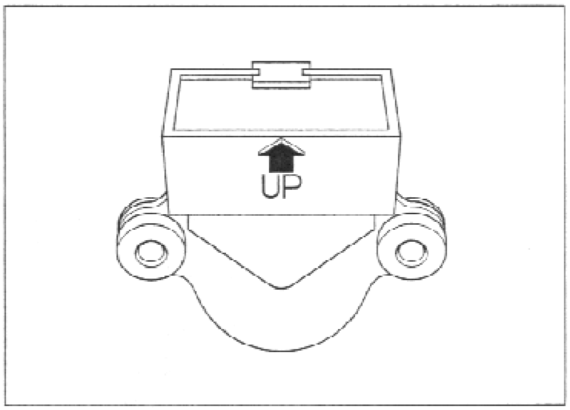
Disconnect the bank angle sensor 3P (Green) connector.
Remove the two screws, nuts and bank angle sensor.



Install the bank angle sensor with its "UP" mark facing up.

Installation is in the reverse order of removal.

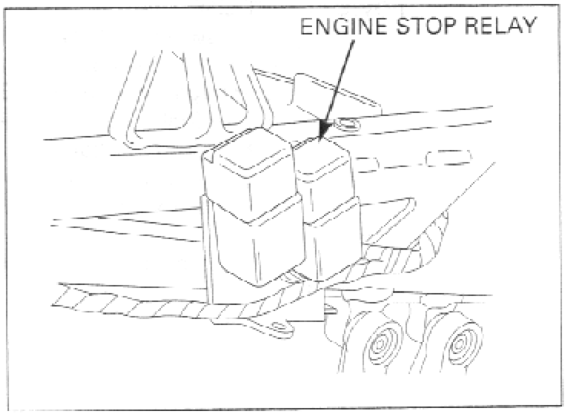
Tighten the mounting screws securely.



ENGINE STOP RELAY

INSPECTION

Disconnect the engine stop relay 4P connector, remove the engine stop relay.



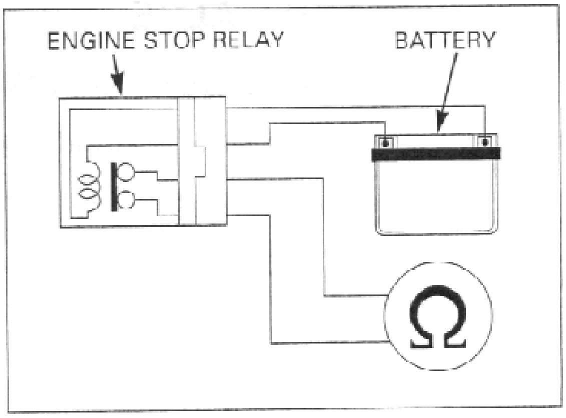
Connect the ohmmeter to the engine stop relay connector terminals.

CONNECTION: Red/White – Black/White

Connect the 12-V battery to the following engine stop relay connector terminals.

CONNECTION: Red/White – Black

There should be continuity only when the 12-V battery is connected.
If there is no continuity when the 12-V battery is connected, replace the engine stop relay.

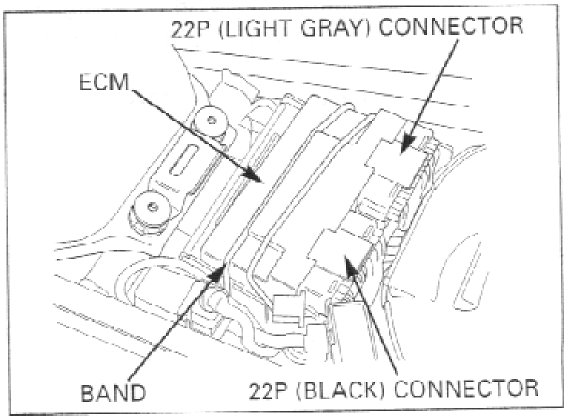


ECM (ENGINE CONTROL MODULE)

REMOVAL/INSTALLATION

Remove the rear cowl (page 2-2).

Remove the ECM holder band and remove the ECM from the battery tray cover.
Disconnect the ECM 22P (Black) and 22P (Light gray) connectors.

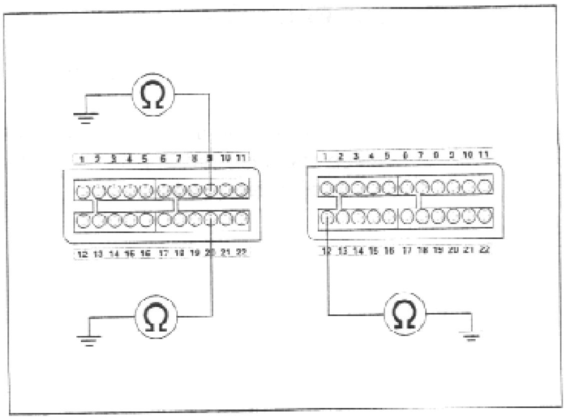


POWER/GROUND LINE INSPECTION

Connect the test harness between the main wire harness and ECM (page 5-8).

TOOL:
ECU test harness **07YMZ–0010100 (two required)**

GROUND LINE
Check for continuity between the ECM test harness connector A9 terminal and ground, between the A20 terminal and ground, and between the B12 terminal and ground.
There should be continuity at all times.
If there is no continuity, check for an open circuit in the Green/Pink wire and Green wire.



POWER INPUT LINE

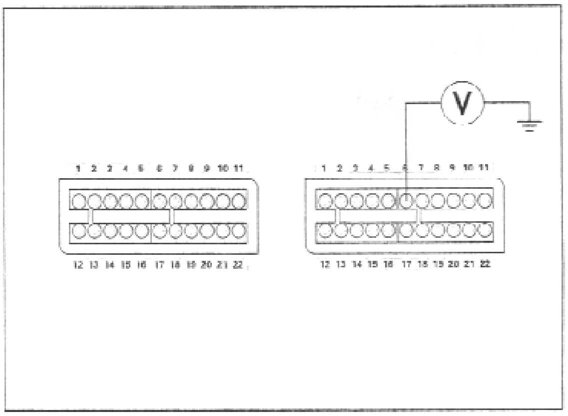
Turn the ignition switch to "ON" with the engine stop switch in the "RUN" position.

Measure the voltage between the ECM test harness connector B6 terminal (+) and ground.

There should be battery voltage.

If there is no voltage, check for an open circuit in the Black/White wire between the ECM and bank angle sensor/relay.

If the wire is OK, check the bank angle sensor/relay (page 5-83).

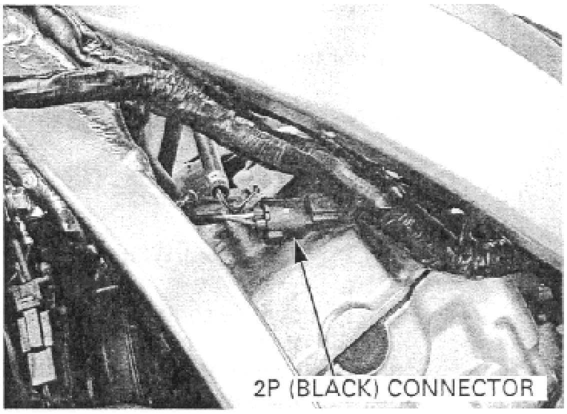


PAIR SOLENOID VALVE

REMOVAL/INSTALLATION

Remove the air cleaner housing (page 5-60).

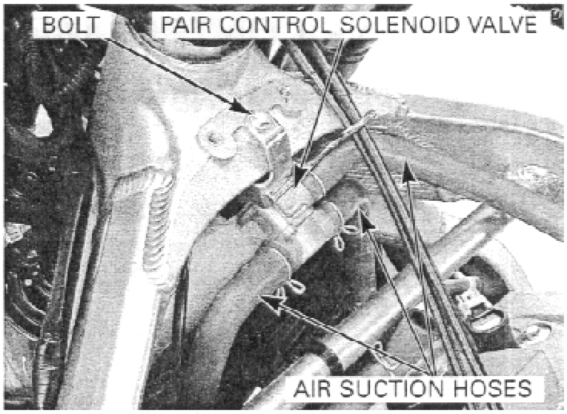
Disconnect the PAIR solenoid valve 2P (Black) connector.



Disconnect the PAIR air suction hoses.

Remove the bolt and PAIR solenoid valve.

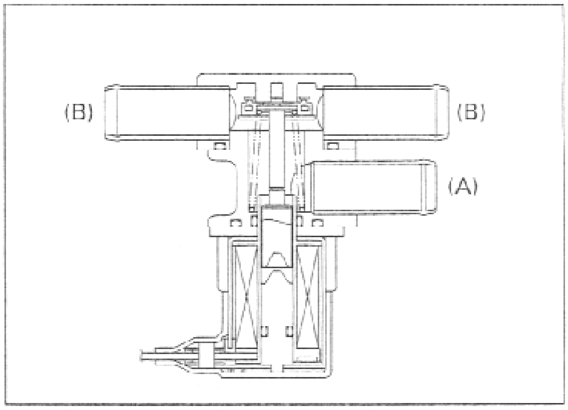
Installation is in the reverse order of removal.



INSPECTION

Remove the PAIR solenoid valve.

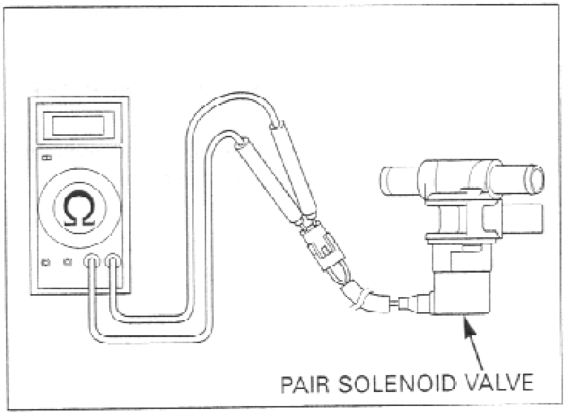
Check that the air should not flow (A) to (B), only when the 12-V battery is connected to the PAIR solenoid valve terminals.



Check the resistance between the terminals of the PAIR solenoid valve.

STANDARD: 20 – 24 Ω (20 °C/68°F)

If the resistance is out of specification, replace the PAIR solenoid valve.

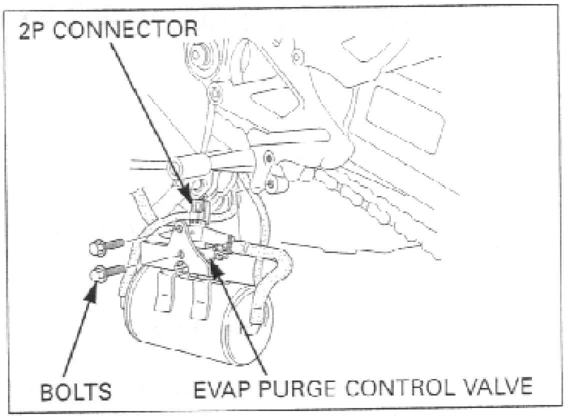


EVAP PURGE CONTROL VALVE (CALIFORNIA TYPE ONLY)

REMOVAL

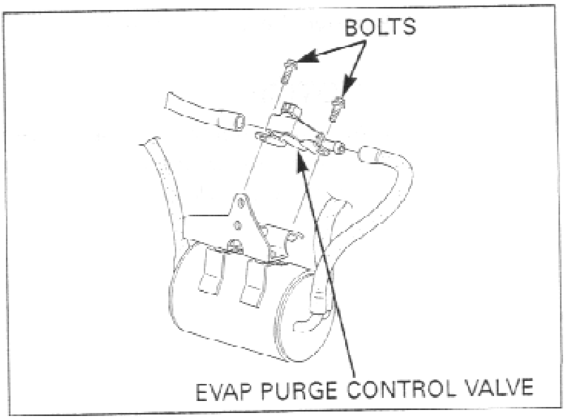
Remove the bolt and EVAP canister/EVAP purge control valve bracket assembly.

Disconnect the EVAP purge control valve 2P connector.



Disconnect the air hoses from the EVAP purge control valve.
Remove the bolts and EVAP purge control solenoid valve.

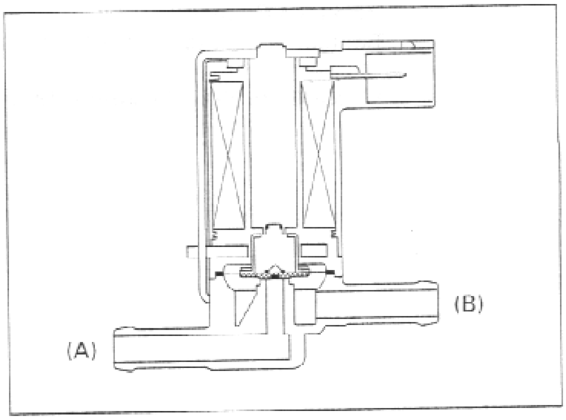
Installation is in the reverse order of removal.



INSPECTION

Remove the EVAP purge control valve.

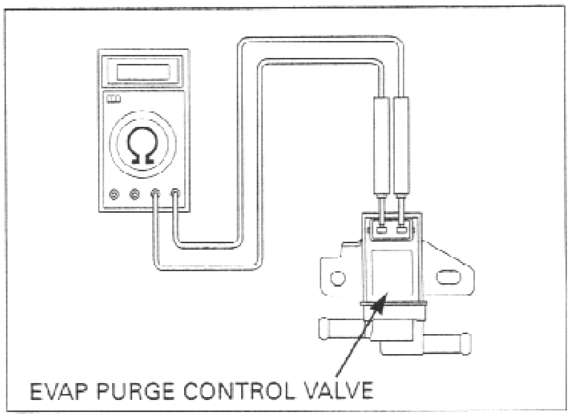
Check that air should not flow (A) to (B), only when the 12-V battery is connected to the EVAP purge control valve terminals.



Check the resistance between the terminals of the EVAP purge control valve.

STANDARD: 30 – 34 Ω (20 °C/68°F)

If the resistance is out of specification, replace the EVAP purge control valve.



O_2 SENSOR (CALIFORNIA TYPE ONLY)

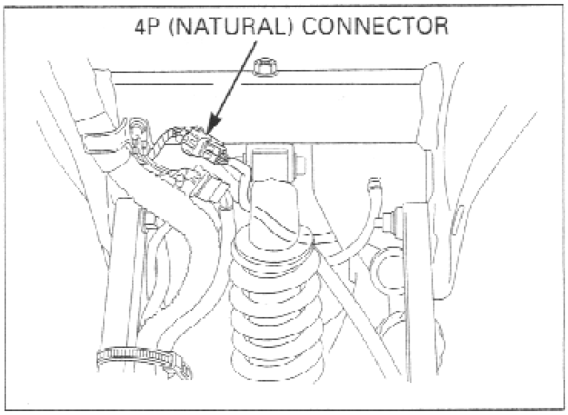
Do not service the O_2 sensor while it is hot.

REMOVAL

NOTICE

- *Handle the O_2 sensor with care.*
- *Do not get grease, oil or other materials in the O_2 sensor air hole.*

Remove the seat (page 2-2).

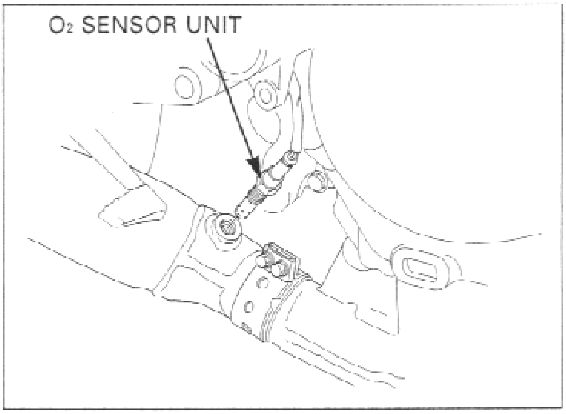


Disconnect the O_2 sensor 4P (Natural) connector.
Remove the O_2 sensor wire from the frame.

Remove the O_2 sensor unit.

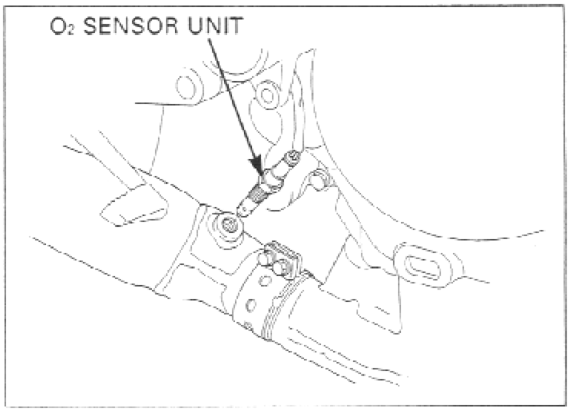
NOTICE

- *Be careful not to damage the sensor wire.*
- *Do not use an impact wrench while removing or installing the O_2 sensor.*

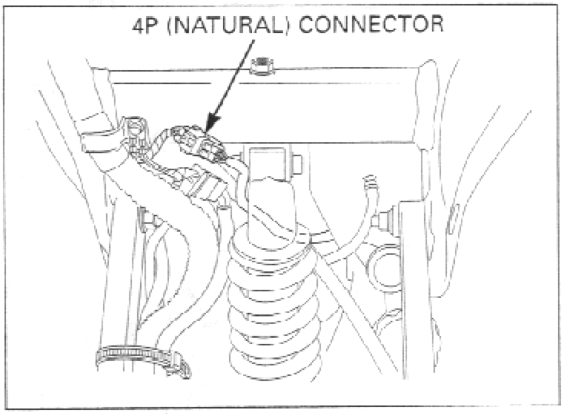


Install the O_2 sensor unit.
Tighten the unit to the specified torque.

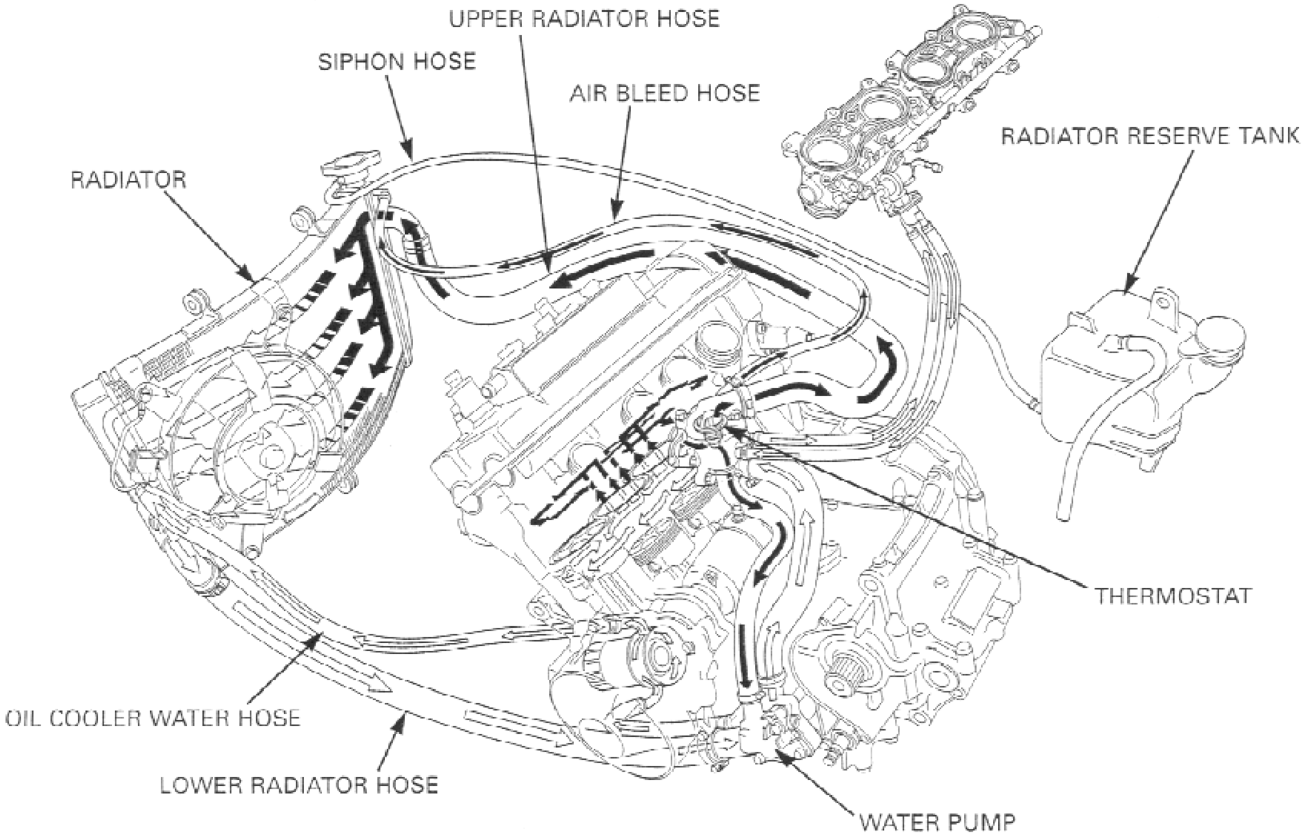
TORQUE: 25 N·m (2.6 kgf·m, 19 lbf·ft)

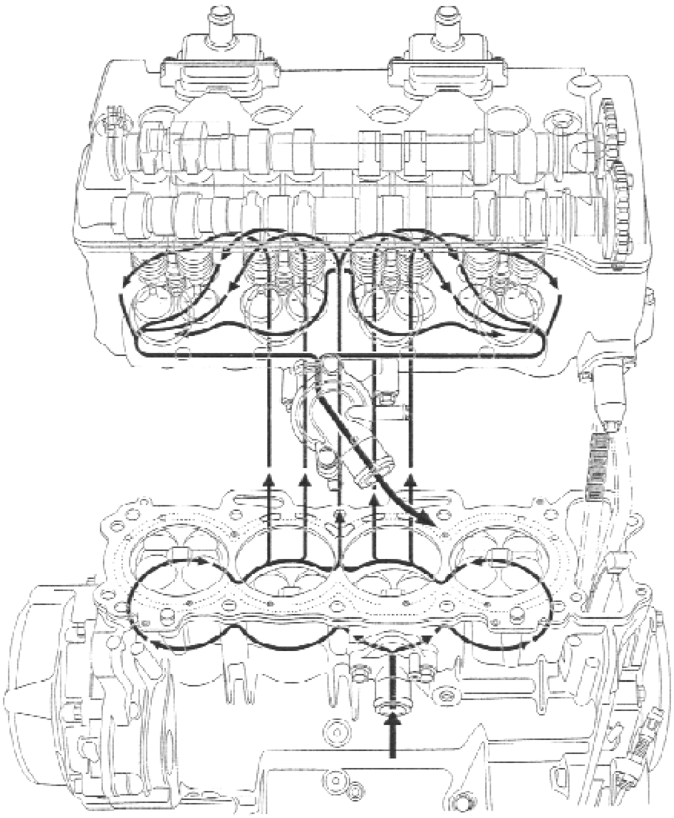


Route the O_2 sensor wire into the frame.
Connect the O_2 sensor 4P (Natural) connector.



SYSTEM FLOW PATTERN





6. COOLING SYSTEM

SERVICE INFORMATION

GENERAL

⚠ WARNING

Wait until the engine is cool before slowly removing the radiator cap.

Removing the cap while the engine is hot and the coolant is under pressure may cause serious scalding.

⚠ CAUTION

Radiator coolant is toxic. Keep it away from eyes, mouth, skin and clothes.

- If any coolant gets in your eyes, rinse them with water and consult a physician immediately.
- If any coolant is swallowed, induce vomiting, gargle and consult a physician immediately.
- If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.

NOTICE

Using coolant with silicate inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

- Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system.
- All cooling system services can be done with the engine in the frame.
- Avoid spilling coolant on painted surfaces.
- After servicing the system, check for leaks with a cooling system tester.
- Refer to section 19 for fan motor switch and coolant temperature sensor inspection.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.7 liter (2.9 US qt, 2.4 Imp qt)
	Reserve tank	0.31 liter (0.33 US qt, 0.27 Imp qt)
Radiator cap relief pressure		108 – 137 kPa (1.1 – 1.4 kgf/cm^2, 16 – 20 psi)
Thermostat	Begin to open	80 – 84 °C (176 – 183 °F)
	Fully open	90 °C (194 °F)
	Valve lift	8 mm (0.3 in) minimum
Recommended antifreeze		Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing corrosion protection inhibitors
Standard coolant concentration		50% mixture with soft water

TORQUE VALUES

Water pump cover flange bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	CT bolt.
Thermostat cover flange bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	CT bolt.
ECT/thermo sensor	23 N•m (2.3 kgf•m, 17 lbf•ft)	
Cooling fan mounting nut	3 N•m (0.27 kgf•m, 2.0 lbf•ft)	Apply a locking agent to the threads.
Fan motor mounting nut	5 N•m (0.5 kgf•m, 3.6 lbf•ft)	
Fan motor switch	18 N•m (1.8 kgf•m, 13 lbf•ft)	Apply sealant to the threads.

TROUBLESHOOTING

Engine temperature too high
- Faulty temperature gauge or ECT/thermo sensor
- Thermostat stuck closed
- Faulty radiator cap
- Insufficient coolant
- Passages blocked in radiator, hoses or water jacket
- Air in system
- Faulty cooling fan motor
- Faulty fan motor switch
- Faulty water pump

Engine temperature too low
- Faulty temperature gauge or ECT/thermo sensor
- Thermostat stuck open
- Faulty cooling fan motor switch

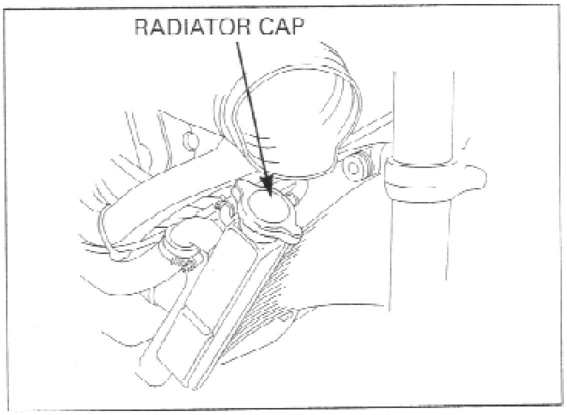
Coolant leak
- Faulty water pump mechanical seal
- Deteriorated O-rings
- Faulty radiator cap
- Damaged or deteriorated cylinder head gasket
- Loose hose connection or clamp
- Damaged or deteriorated hose

SYSTEM TESTING

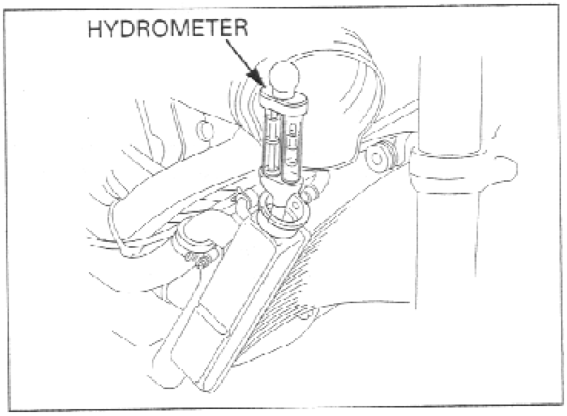
COOLANT (HYDROMETER TEST)

Remove the right air intake duct (page 2-7).

Remove the radiator cap.



Test the coolant gravity using a hydrometer (see below for "COOLANT GRAVITY CHART").
For maximum corrosion protection, a 1:1 solution of ethylene glycol and distilled water is recommended (page 6-4).
Look for contamination and replace the coolant if necessary.



COOLANT GRAVITY CHART

Coolant temperature °C (°F) / Coolant ratio %	0 (32)	5 (41)	10 (50)	15 (59)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)	45 (113)	50 (122)
5	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.999	0.997
10	1.018	1.017	1.017	1.016	1.015	1.014	1.013	1.011	1.009	1.007	1.005
15	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
20	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
25	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
30	1.053	1.052	1.051	1.047	1.046	1.045	1.043	1.041	1.038	1.035	1.032
35	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
40	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
45	1.080	1.078	1.076	1.074	1.072	1.069	1.066	1.063	1.060	1.057	1.054
50	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
55	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071

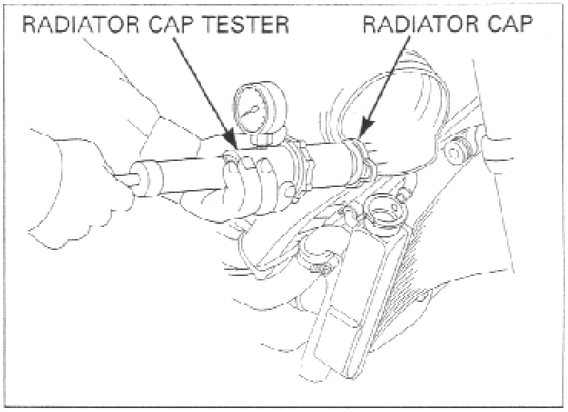
RADIATOR CAP/SYSTEM PRESSURE INSPECTION

Before installing the cap in the tester, wet the sealing surfaces.

Remove the radiator cap (see previous page).

Pressure test the radiator cap.
Replace the radiator cap if it does not hold pressure, or if relief pressure is too high or too low.
It must hold the specified pressure for at least 6 seconds.

RADIATOR CAP RELIEF PRESSURE:
108 – 137 kPa (1.1 – 1.4 kgf/cm², 16 – 20 psi)

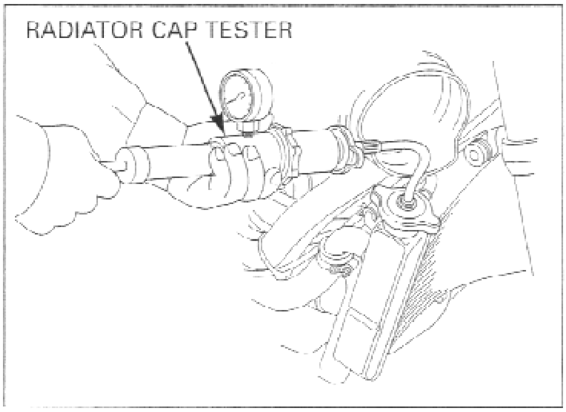


Pressurize the radiator, engine and hoses, and check for leaks.

NOTICE

Excessive pressure can damage the cooling system components. Do not exceed 137 kPa (1.4 kgf/cm², 20 psi).

Repair or replace components if the system will not hold the specified pressure for at least 6 seconds.



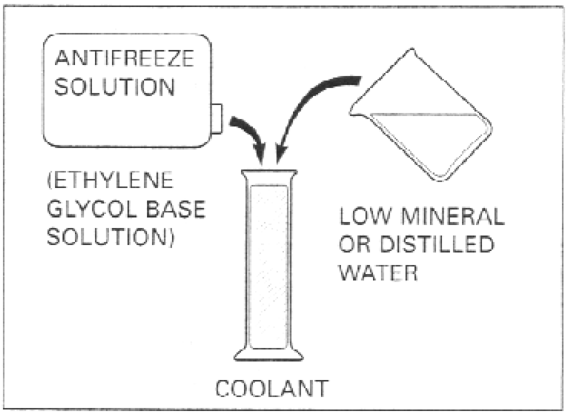
COOLANT REPLACEMENT

PREPARATION

- The effectiveness of coolant decreases with the accumulation of rust or if there is a change in the mixing proportion during usage. Therefore, for best performance change the coolant regularly as specified in the maintenance schedule.
- Mix only distilled, low mineral water with the antifreeze.

RECOMMENDED ANTIFREEZE:
Pro Honda HP Coolant or an equivalent high quality ethylene glycol antifreeze containing corrosion protection inhibitors

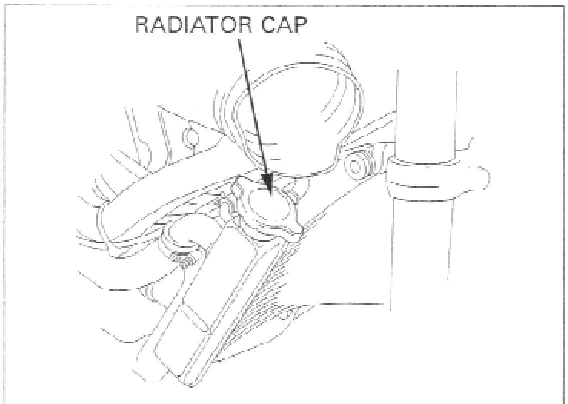
RECOMMENDED MIXTURE:
1:1 (distilled water and antifreeze)



REPLACEMENT/AIR BLEEDING

When filling the system or reserve tank with coolant (checking the coolant level), place the motorcycle in a vertical position on a flat, level surface.

Remove the radiator cap.



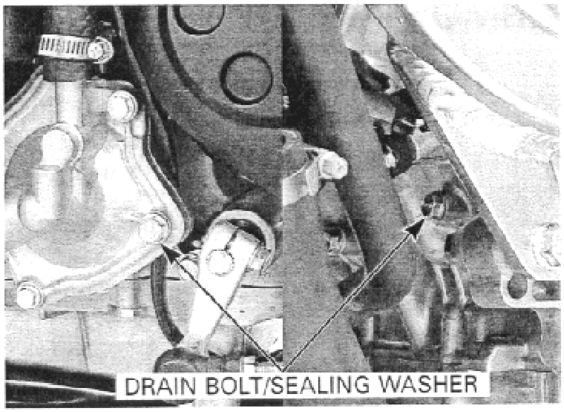
Remove the lower cowl (page 2-4).

Remove the drain bolt on the water pump cover and drain the coolant.

Remove the cylinder drain bolt and drain the coolant from the cylinder.

Reinstall the drain bolt with the new sealing washer. Tighten the water pump drain bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

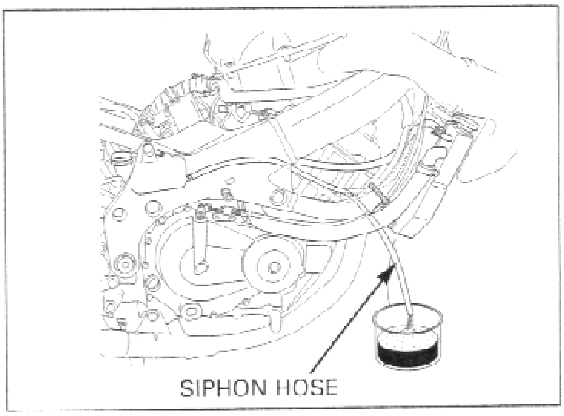


Remove the right air duct (page 2-7)

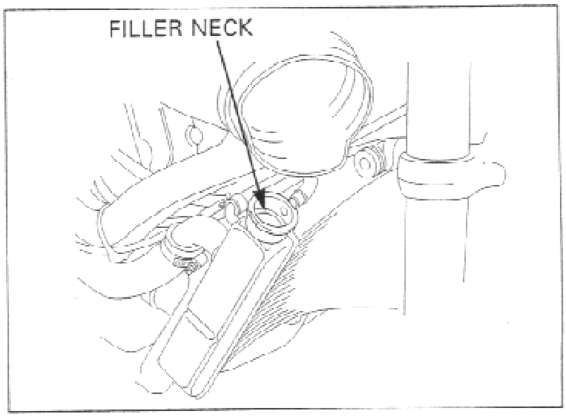
Disconnect the siphon hose from the radiator.

Drain the reserve tank coolant.
Empty the coolant and rinse the inside of the reserve tank with water.

Reinstall the radiator siphon hose.

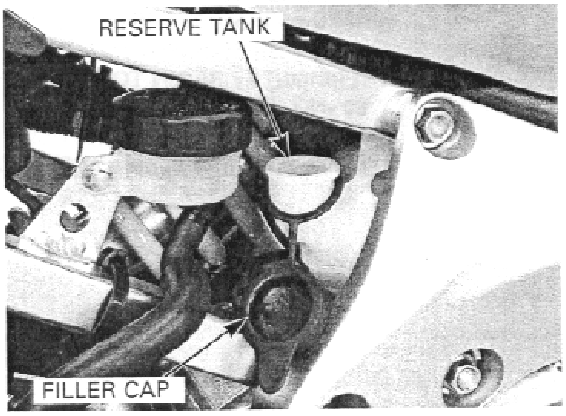


Fill the system with the recommended coolant through the filler opening up to the filler neck.



Remove the radiator reserve tank cap and fill the reserve tank to the upper level line.

Bleed air from the system as follow:
1. Shift the transmission into neutral. Start the engine and let it idle for 2 – 3 minutes.
2. Snap the throttle three to four times to bleed air from the system.
3. Stop the engine and add coolant to the proper level if necessary. Reinstall the radiator cap.
4. Check the level of coolant in the reserve tank and fill to the upper level if it is low.

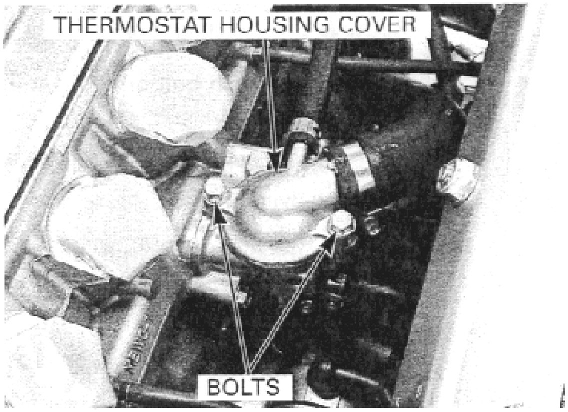


THERMOSTAT

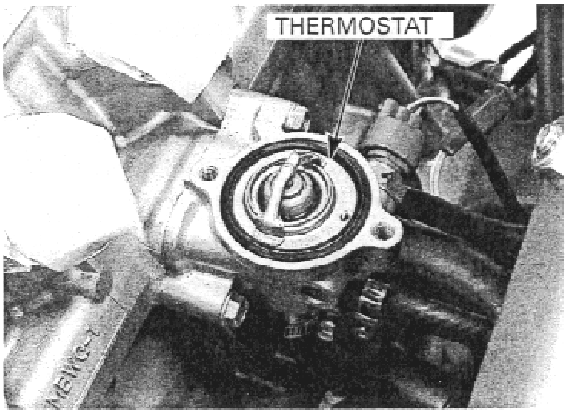
THERMOSTAT REMOVAL

Drain the coolant (page 6-5).
Remove the throttle body (page 5-62).

Remove the bolts and thermostat housing cover.

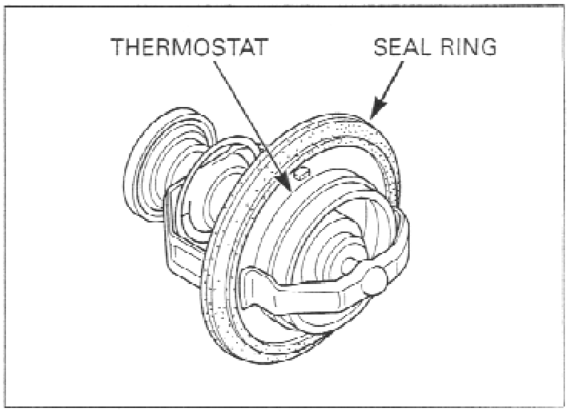


Remove the thermostat from the housing.



INSPECTION

Wear insulated gloves and adequate eye protection. Keep flammable materials away from the electric heating element.



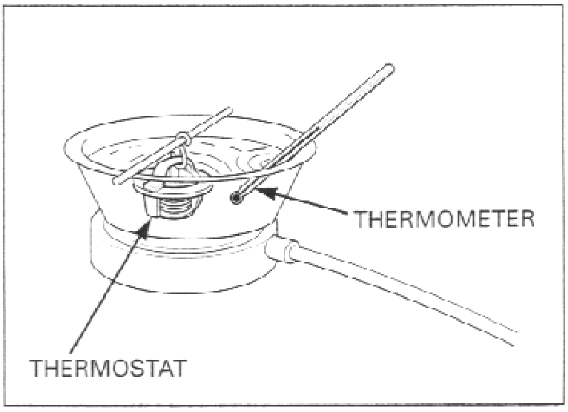
Visually inspect the thermostat for damage.
Check for damage of the seal ring.

Do not let the thermostat or thermometer touch the pan, or you will get false readings.

Heat the water with an electric heating element to operating temperature for 5 minutes.
Suspend the thermostat in heated water to check its operation.

Replace the thermostat if the valve stays open at room temperature, or if it responds at temperatures other than those specified.

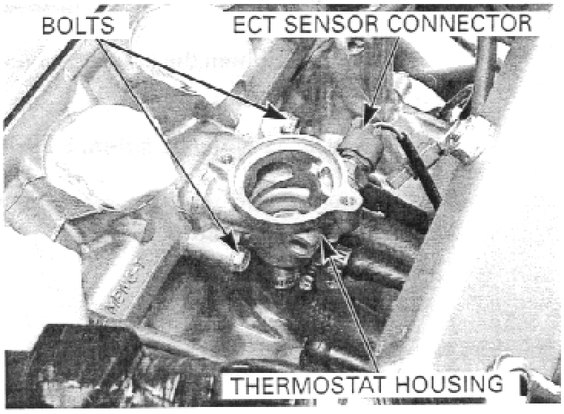
THERMOSTAT BEGIN TO OPEN:
80 – 84 °C (176 – 183 °F)
VALVE LIFT:
8 mm (0.3 in) minimum at 95 °C (203 °F)



THERMOSTAT HOUSING REMOVAL

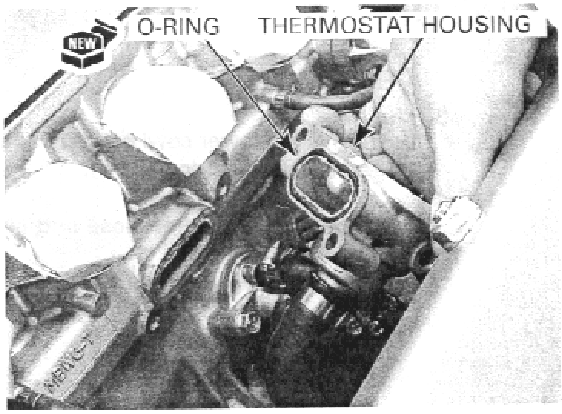
Disconnect the ECT sensor connector.
Disconnect the fast idle wax unit water hose and bypass hose from the thermostat housing.

Remove the bolts and thermostat housing from the cylinder head.



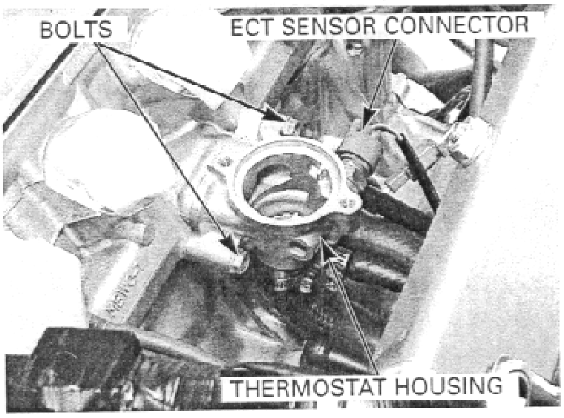
THERMOSTAT HOUSING INSTALLATION

Install a new O-ring into the groove of the thermostat body.
Install the thermostat housing onto the cylinder head.



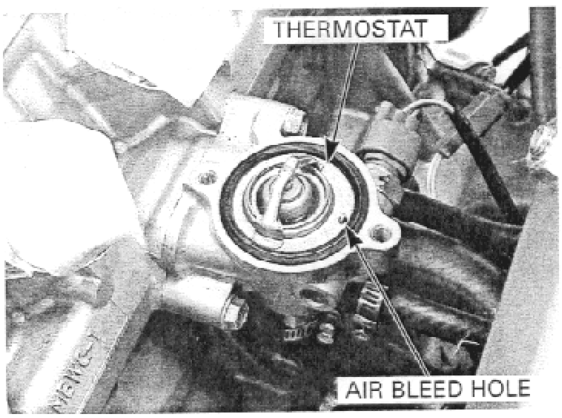
Install and tighten the thermostat housing mounting bolts.

Connect the fast idle wax unit water hose and bypass hose.
Connect the ECT sensor connector.



THERMOSTAT INSTALLATION

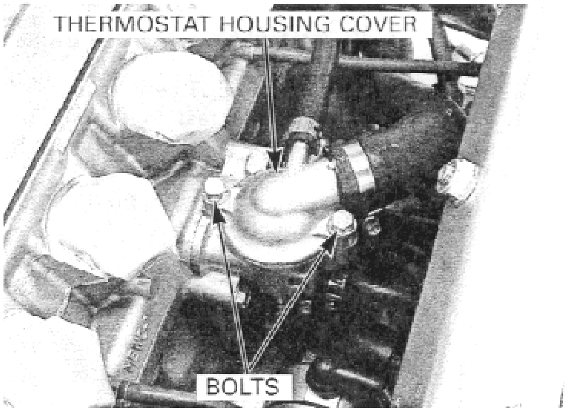
Install the thermostat into the housing with its air bleed hole facing rearward.



Install the thermostat housing cover onto the housing.
Install and tighten the housing cover bolts to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Fill the system with the recommended coolant and bleed any air (page 6-5).

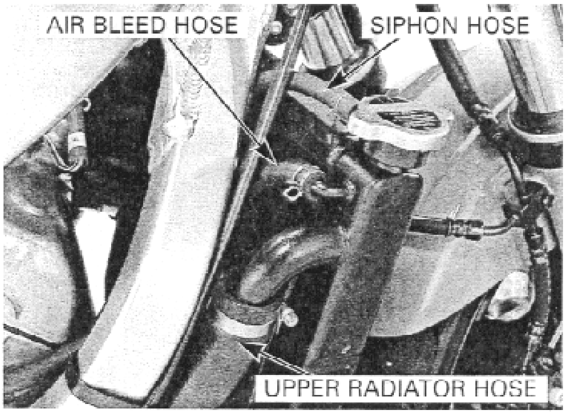


RADIATOR

REMOVAL

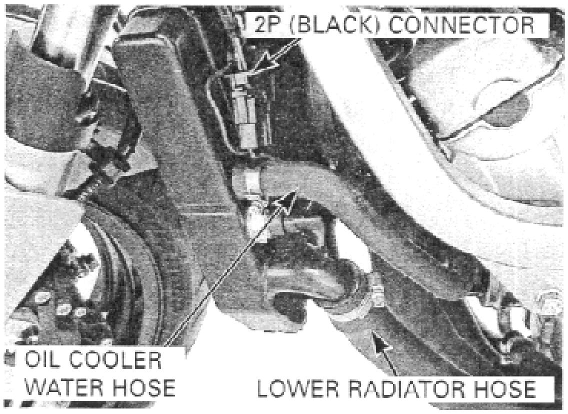
Remove the lower cowl and inner half cowl (page 2-4).
Drain the coolant (page 6-4).

Disconnect the siphon hose and air bleed hose from the radiator.
Disconnect the upper radiator hose.

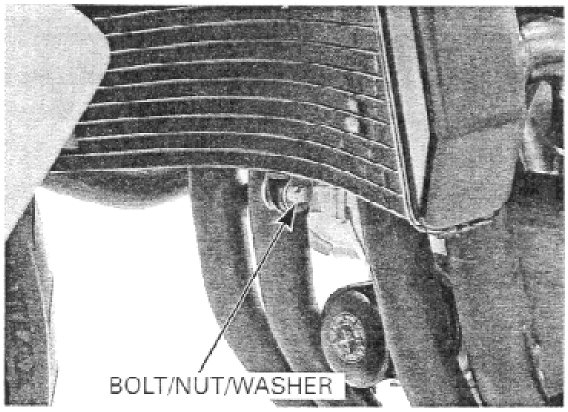


Disconnect the radiator sub-harness 2P (Black) connector.

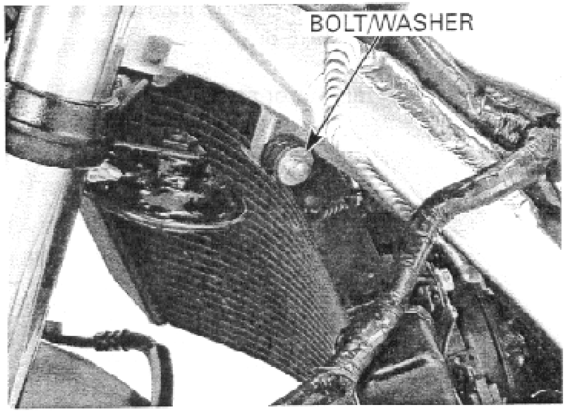
Disconnect the lower radiator hose and oil cooler water hose.



Remove the radiator lower mounting bolt/nut and washer.



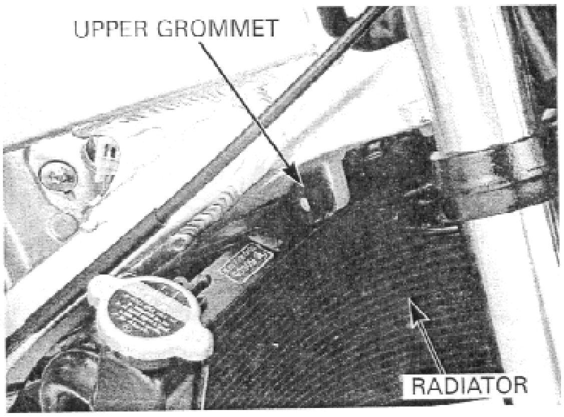
Remove the radiator upper mounting bolt and washer.



Slide the radiator to the right, then release the upper grommet from the frame boss.

Remove the radiator assembly.

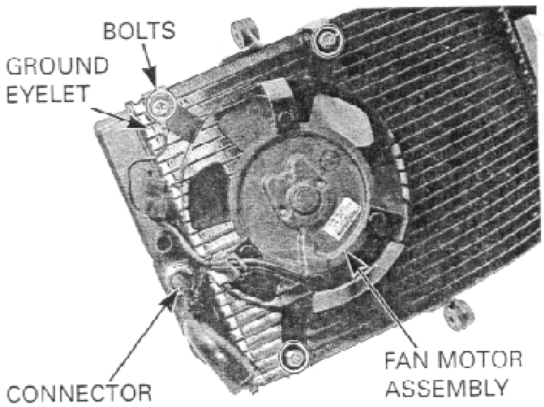
Be careful not to damage the radiator core.



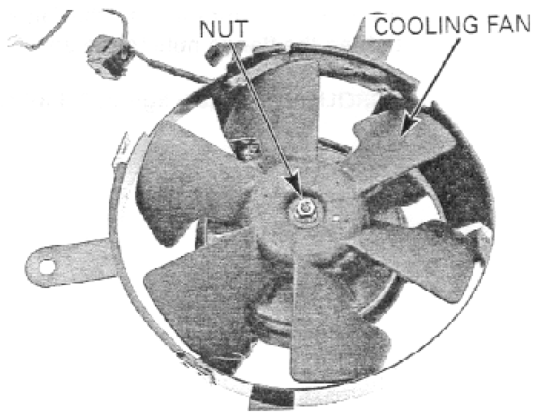
DISASSEMBLY

Disconnect the fan motor switch connector.

Remove the three bolts, ground eyelet and cooling fan motor assembly.

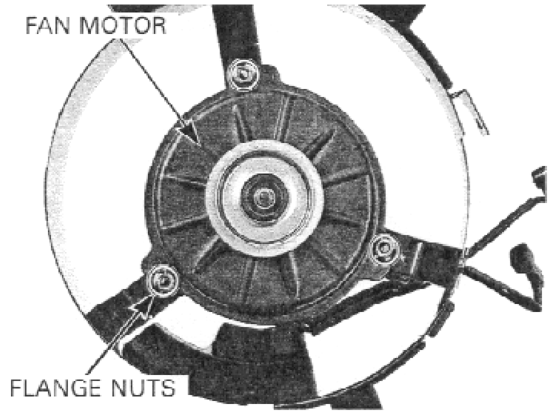


Remove the nut and cooling fan.

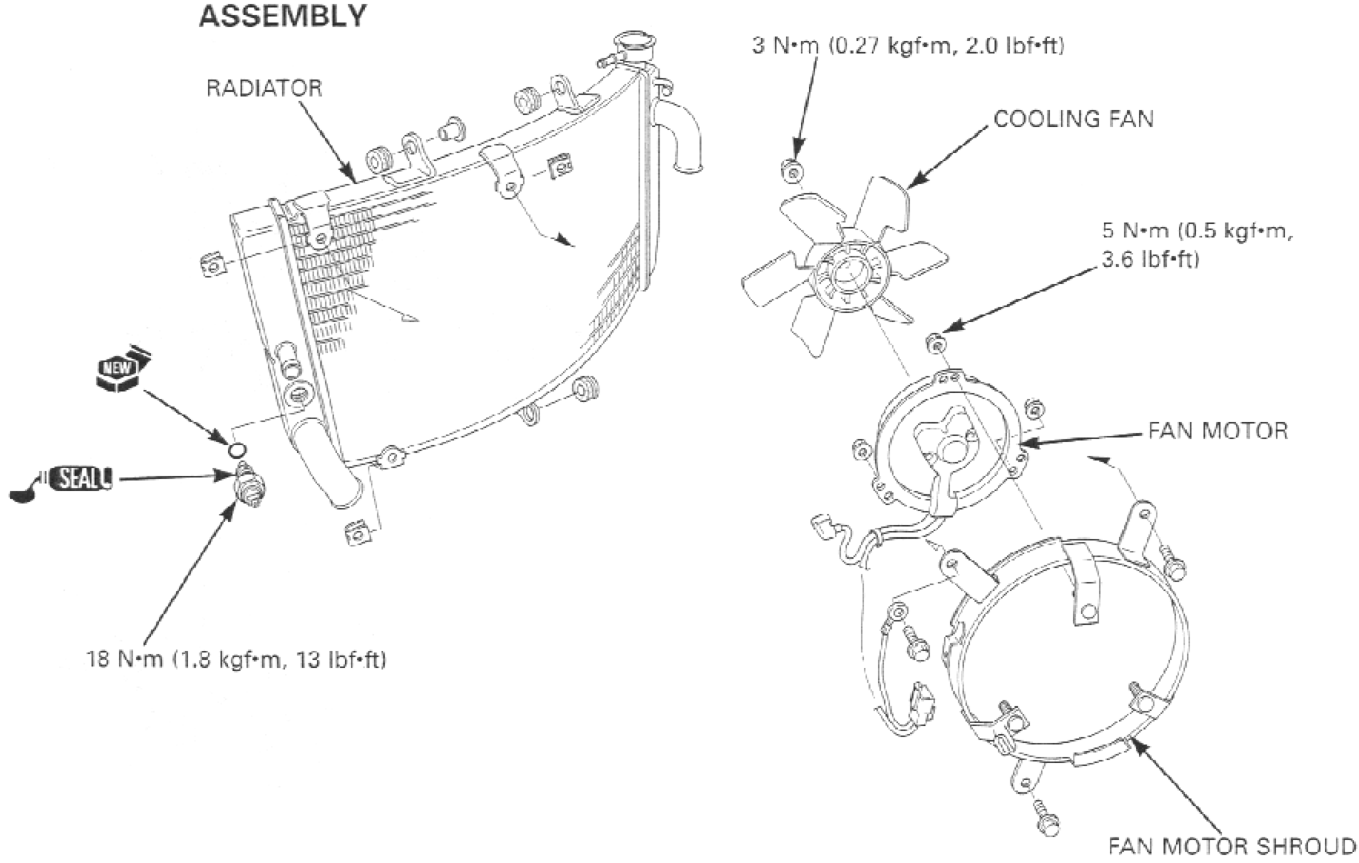


Remove the flange nuts and fan motor from the fan motor shroud.

For fan motor switch information, refer to page 19-15.

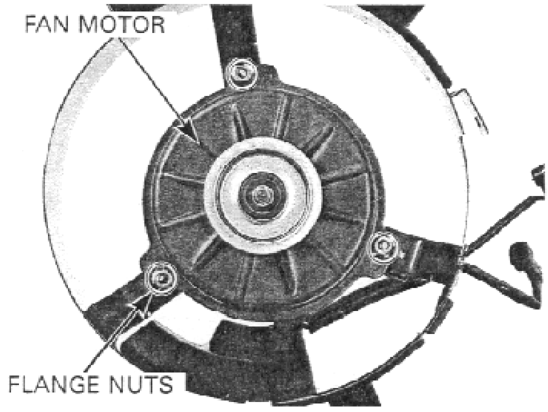


ASSEMBLY

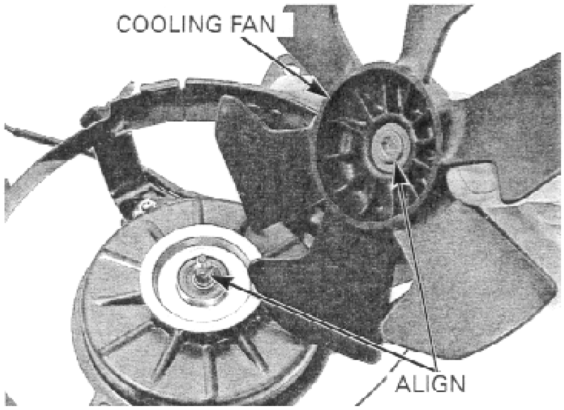


Install the fan motor onto the fan motor shroud and tighten the flange nuts to the specified torque.

TORQUE: 5 N•m (0.5 kgf•m, 3.6 lbf•ft)

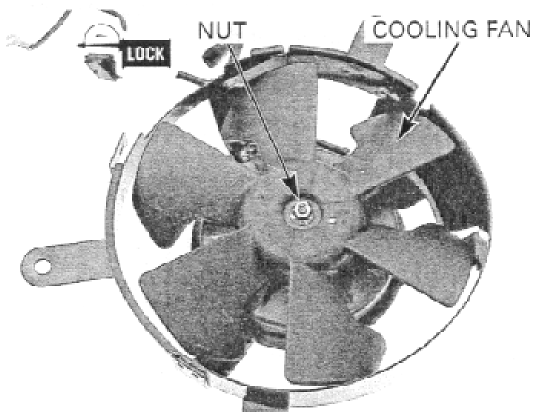


Install the cooling fan onto the fan motor shaft by aligning the flat surfaces.



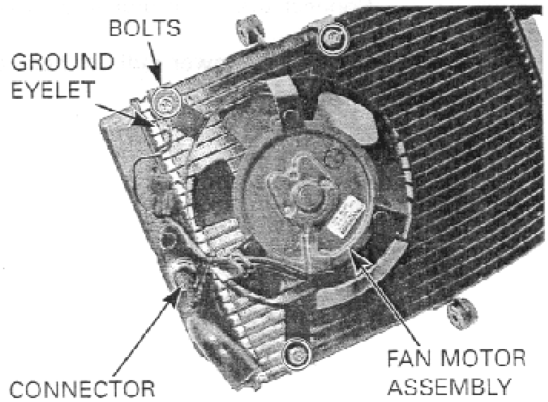
Apply a locking agent to the cooling fan nut threads. Install and tighten the nut to the specified torque.

TORQUE: 3 N•m (0.27 kgf•m, 2.0 lbf•ft)



Install the cooling fan motor assembly onto the radiator.
Route the ground eyelet properly.
Install and tighten the bolts.

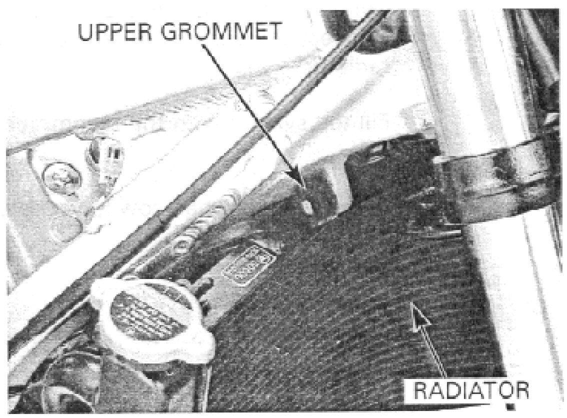
Install the radiator sub-harness connector to the fan motor bracket.
Connect the fan motor switch connector.



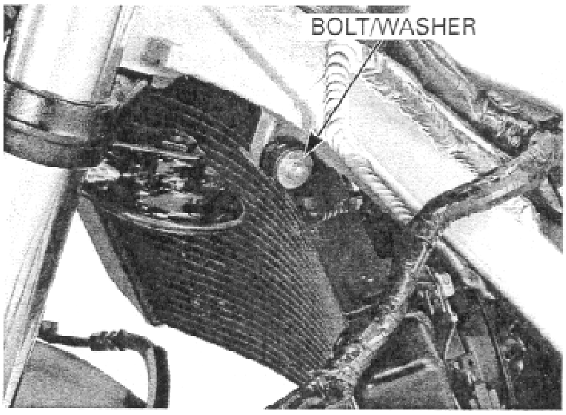
INSTALLATION

Be careful not to damage the radiator core.

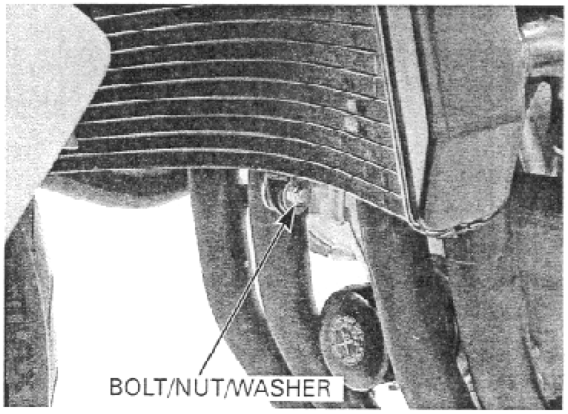
Install the radiator assembly, aligning its grommet with the frame boss.



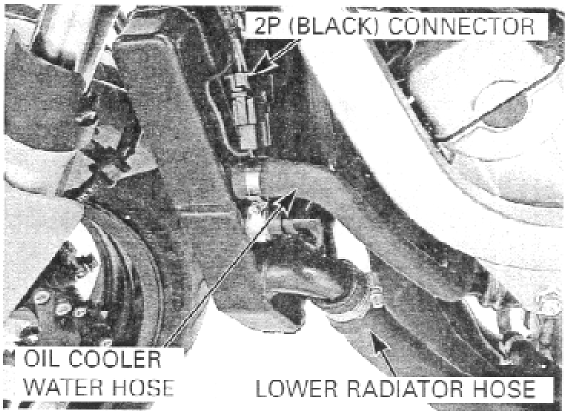
Install the washer and upper mounting bolt, then tighten the bolt.



Install the radiator lower mounting bolt/nut, tighten the nut securely.



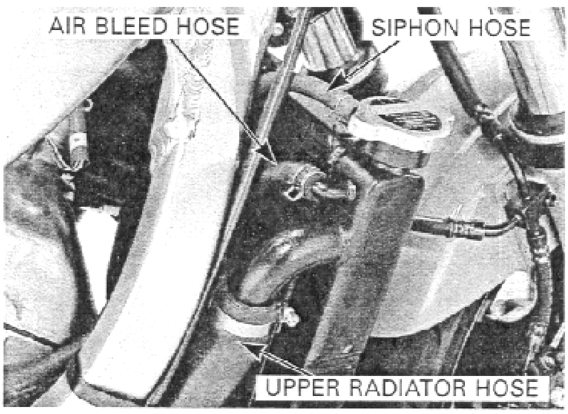
Connect the fan motor sub-harness 2P (Black) connector.
Connect the lower radiator hose and oil cooler water hose.



Connect the upper radiator hose.
Connect the siphon hose and air bleed hose to the radiator.

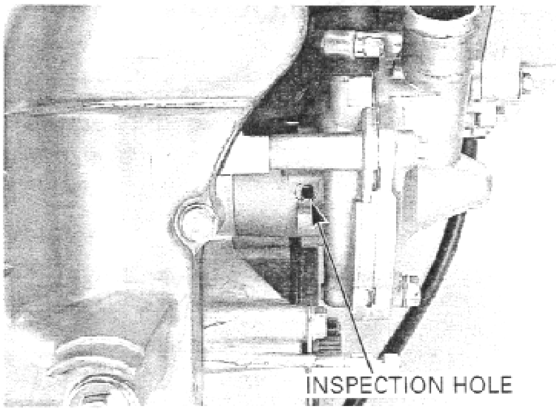
Fill the system with the recommended coolant (page 6-5).

Install the inner half cow/lower cowl (page 2-5).



WATER PUMP

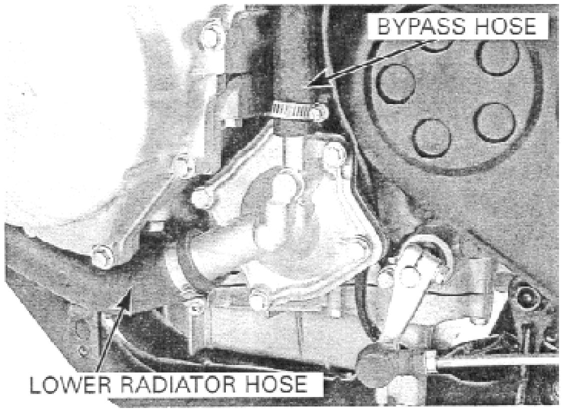
MECHANICAL SEAL INSPECTION



Remove the lower cowl (page 2-4).

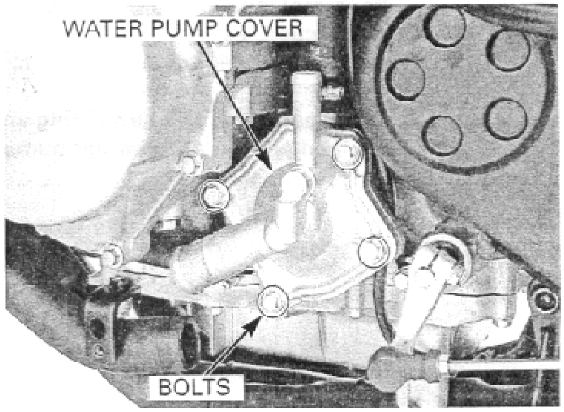
Inspect the inspection hole for signs of coolant leakage.
If there is leakage, the mechanical seal is defective and replace the water pump as an assembly.

REMOVAL

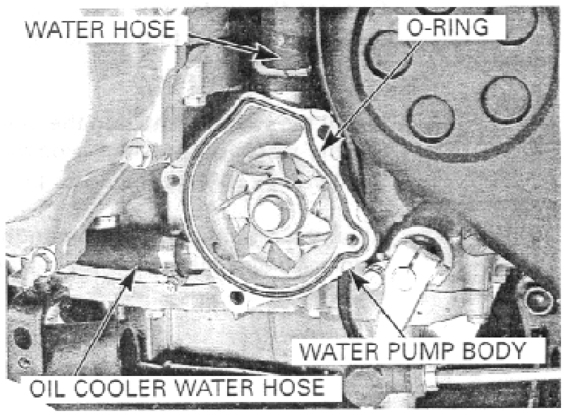


Drain the coolant (page 6-4).

Disconnect the lower radiator hose and bypass hose from the water pump cover.



Remove the two SH bolts, two flange bolts and water pump cover.

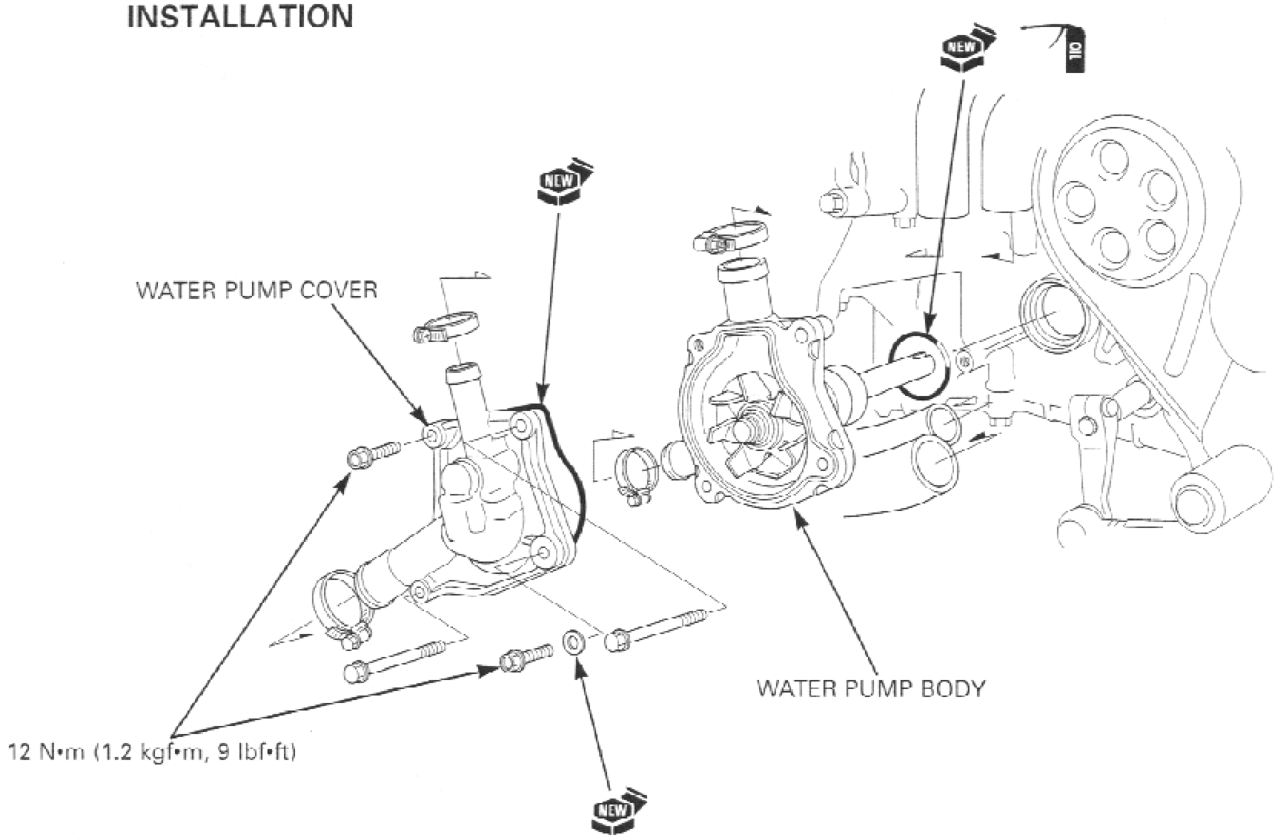


Remove the O-ring from the water pump body.

Disconnect the water pump-to-water joint hose and oil cooler water hose from the water pump body.

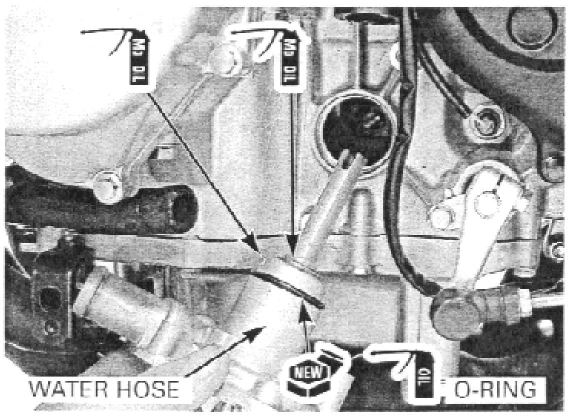
Remove the water pump body from the crankcase.

INSTALLATION



Pour molybdenum oil solution into the hole in the water pump as shown.
Apply molybdenum oil solution to the thrust washer.

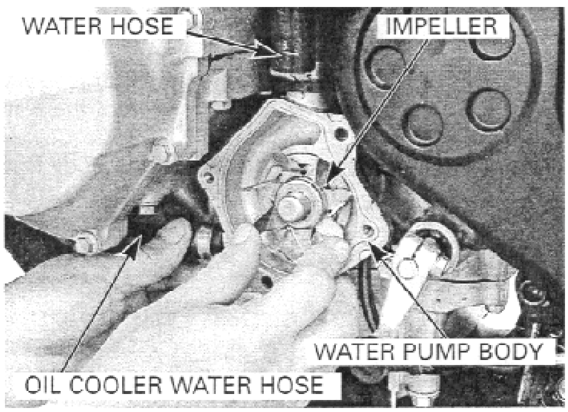
Apply engine oil to a new O-ring and install it onto the stepped portion of the water pump.



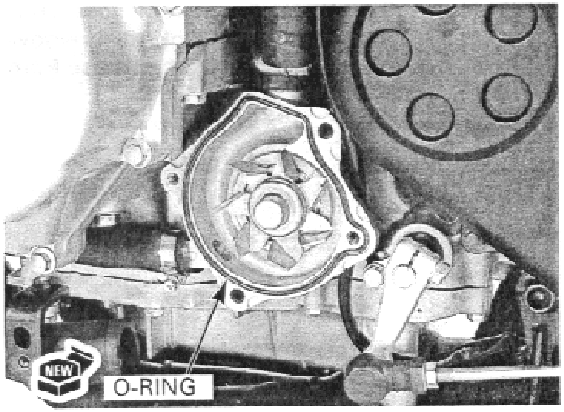
Connect the water pump-to-water joint hose and oil cooler water hose to the water pump and tighten the clamp screws.

Install the water pump into the crankcase while aligning the water pump shaft groove with the oil pump shaft end by turning the water pump impeller.

Align the mounting bolt holes in the water pump and crankcase and make sure the water pump is securely installed.



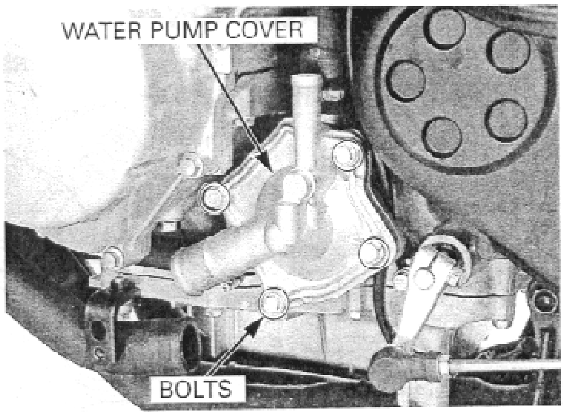
Install a new O-ring into the groove in the water pump body.



Install the water pump cover, two SH bolts and two flange bolts.
Tighten the flange bolts to the specified torque.

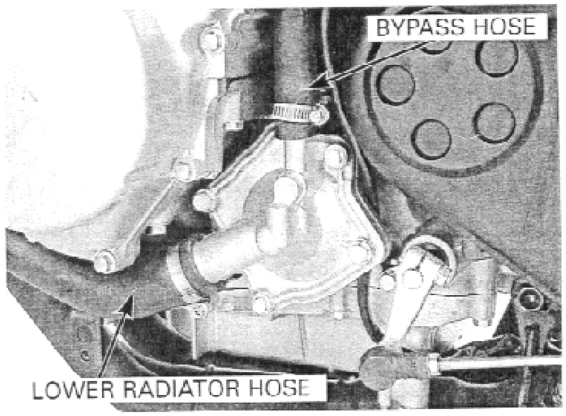
TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Tighten the two SH bolts.



Connect the lower radiator hose and bypass hose, then tighten the clamp screws.

Fill the system with the recommended coolant (page 6-5).
Install the lower cowl (page 2-5).

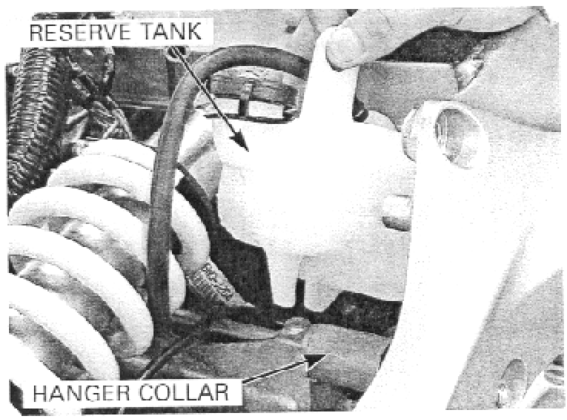


RADIATOR RESERVE TANK

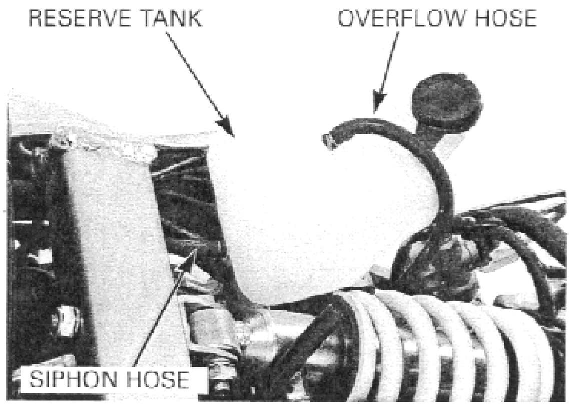
REMOVAL

Remove the seat rail (page 2-16).

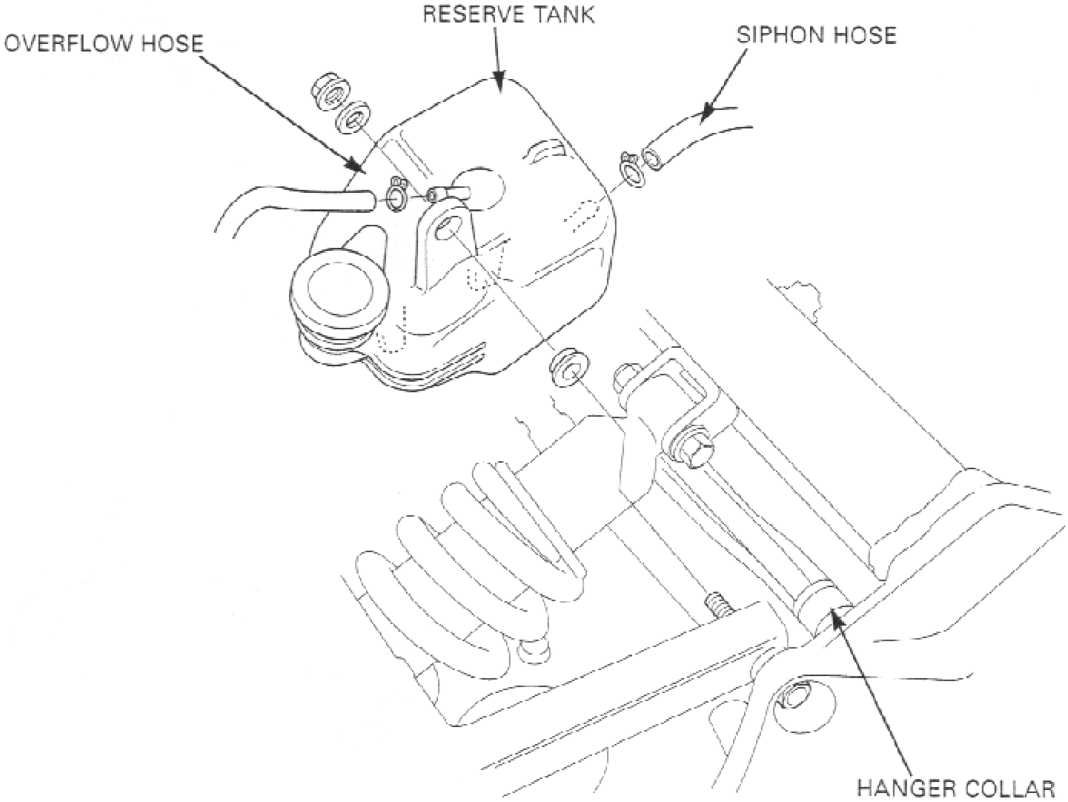
Remove the radiator reserve tank from the engine hanger collar.



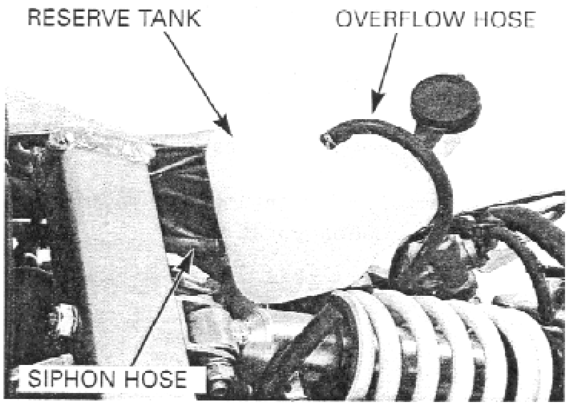
Disconnect the siphon hose and drain the coolant from the reserve tank, then remove the reserve tank.
Disconnect the overflow hose from the reserve tank.



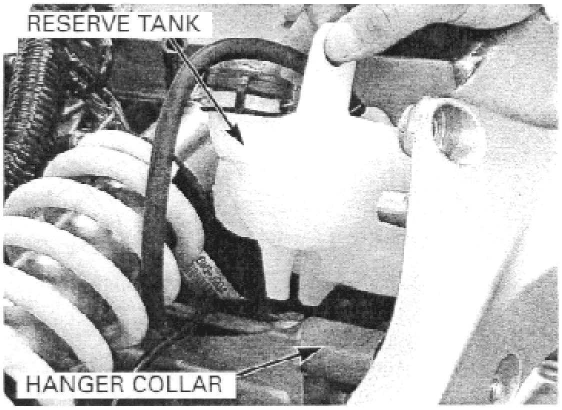
INSTALLATION



Connect the siphon hose and overflow hose to the reserve tank.



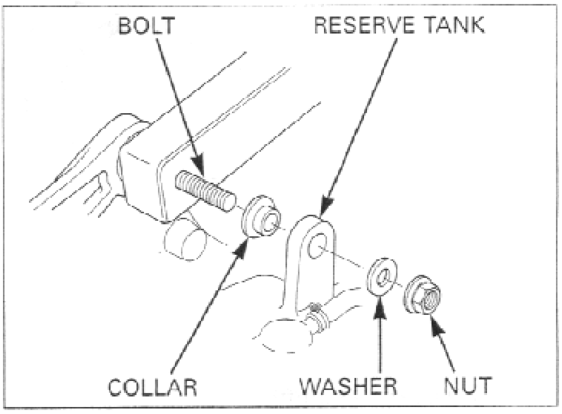
Install the reserve tank onto the engine hanger collar.

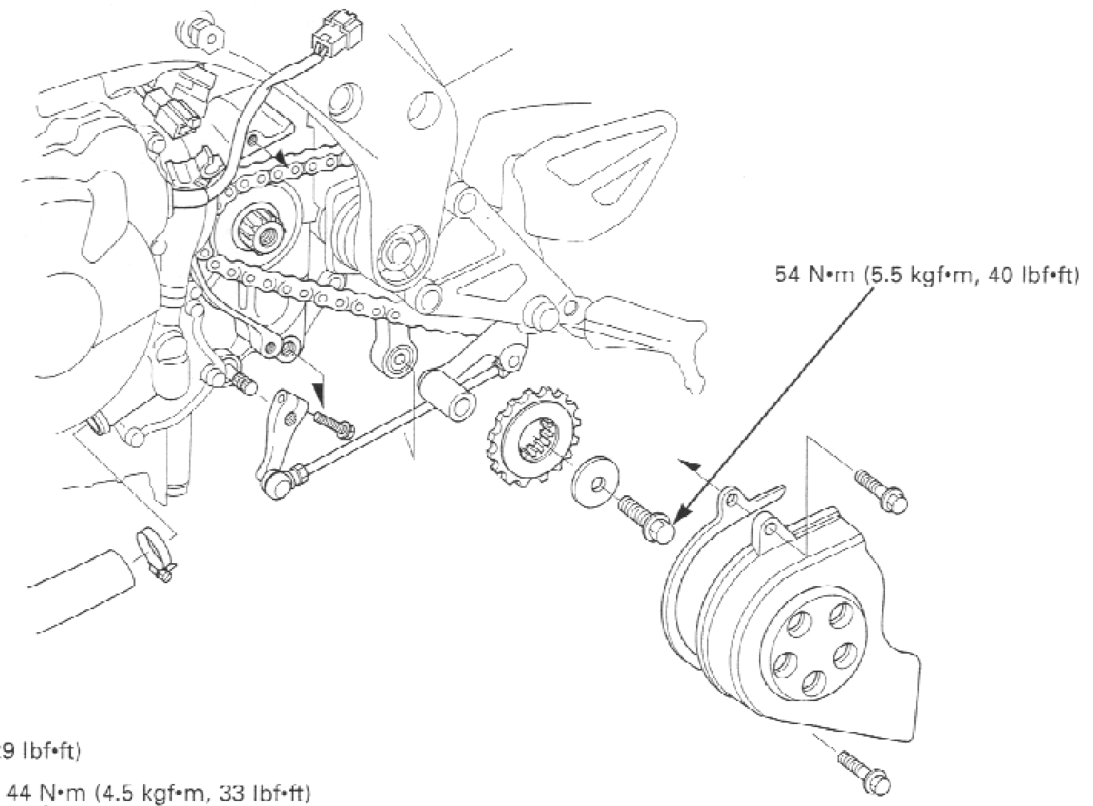


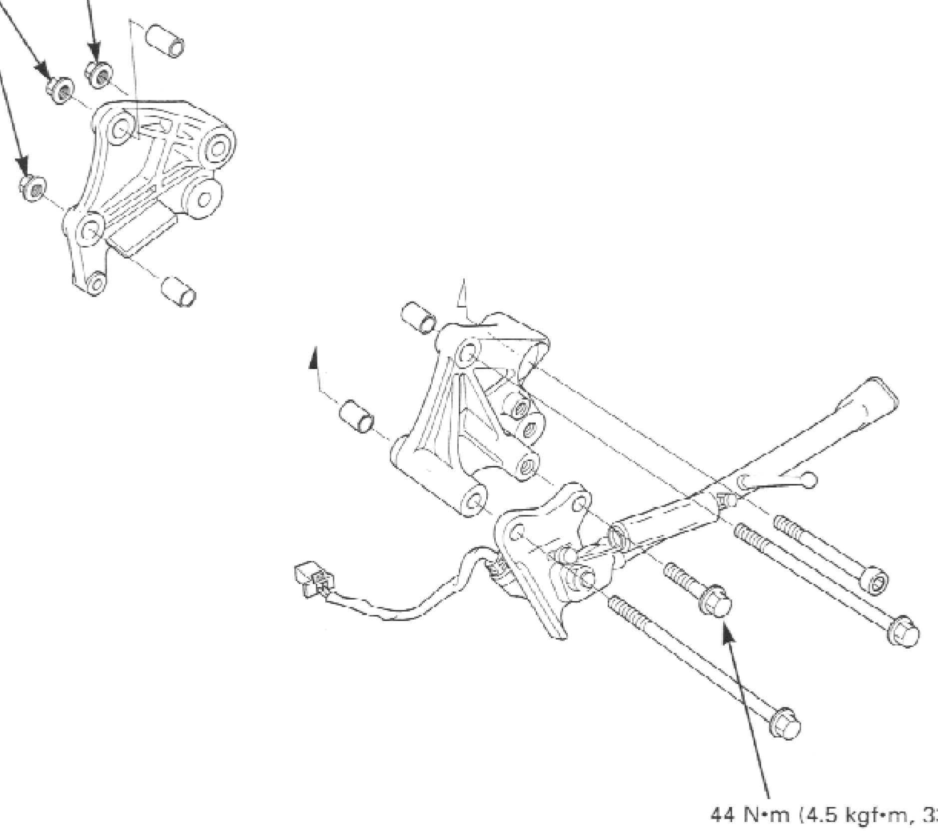
Install the seat rail (page 2-17).

Install the flange collar and washer as shown.

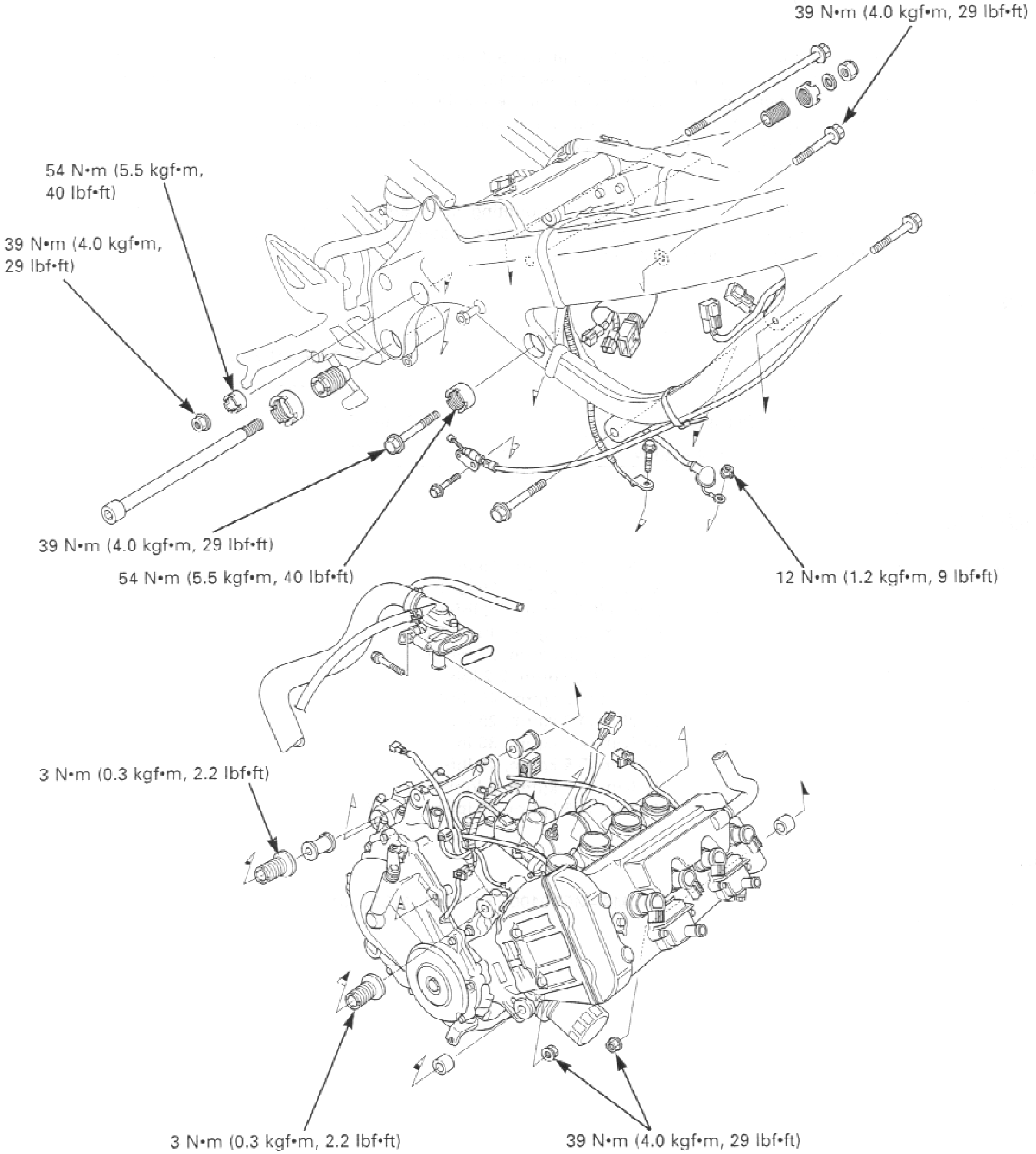
Tighten the seat rail mounting nuts (page 2-17).




54 N•m (5.5 kgf•m, 40 lbf•ft)


39 N•m (4.0 kgf•m, 29 lbf•ft)
44 N•m (4.5 kgf•m, 33 lbf•ft)
44 N•m (4.5 kgf•m, 33 lbf•ft)

7. ENGINE REMOVAL/INSTALLATION



SERVICE INFORMATION

GENERAL

- A hoist or equivalent is required to support the motorcycle when removing and installing the engine.
- A floor jack or other adjustable support is required to support and maneuver the engine.

NOTICE

Do not use the oil filter as a jacking point.

- When using the lock nut wrench for the adjusting bolt lock nut, use a 20 inch long deflecting beam type torque wrench. The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the lock nut. The specification given is the actual torque applied to the lock nut, not the reading on the torque wrench. Do not overtighten the lock nut. The specification later in the text gives both actual and indicated torque values.
- The following components require engine removal for service.
  - Crankshaft piston/cylinder (Section 12)
  - Transmission (Section 11)
- When installing the engine, be sure to tighten the engine mounting fasteners to the specified torque in the specified sequence. If you do not tighten to the proper torque or to in the proper sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the correct sequence.

SERVICE DATA

ITEM		SPECIFICATIONS
Engine dry weight		59 kg (130 lbs)
Engine oil capacity	After disassembly	3.7 liter (3.9 US qt, 3.3 Imp qt)
Coolant capacity	Radiator and engine	2.7 liter (2.9 US qt, 2.4 Imp qt)

TORQUE VALUES

Front engine hanger bolt	39 N•m (4.0 kgf•m, 29 lbf•ft)	
Center engine hanger bolt	39 N•m (4.0 kgf•m, 29 lbf•ft)	
Center engine hanger adjusting bolt (right side)	3 N•m (0.3 kgf•m, 2.2 lbf•ft)	
Center engine hanger lock nut (right side)	54 N•m (5.5 kgf•m, 40 lbf•ft)	
Rear engine hanger nut	39 N•m (4.0 kgf•m, 29 lbf•ft)	
Rear engine hanger adjusting bolt (right side)	3 N•m (0.3 kgf•m, 2.2 lbf•ft)	
Rear engine hanger lock nut (right side)	54 N•m (5.5 kgf•m, 40 lbf•ft)	
Shock link bracket nut	39 N•m (4.0 kgf•m, 29 lbf•ft)	
Shock link-to-bracket nut	44 N•m (4.5 kgf•m, 33 lbf•ft)	
Drive sprocket special bolt	54 N•m (5.5 kgf•m, 40 lbf•ft)	
Starter motor terminal nut	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Side stand bracket bolt	44 N•m (4.5 kgf•m, 33 lbf•ft)	ALOC bolt.

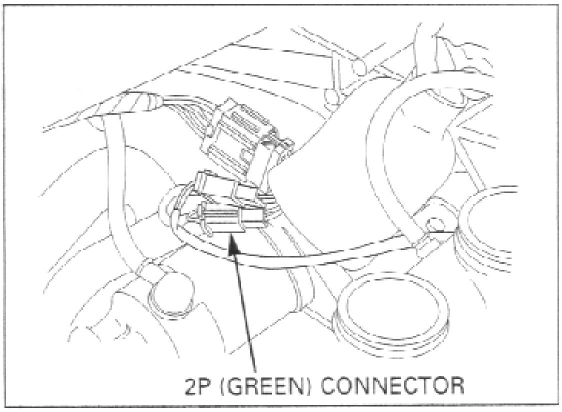
TOOL

Lock nut wrench	07VMA–MBB0100 or 07VMA–MBB0101

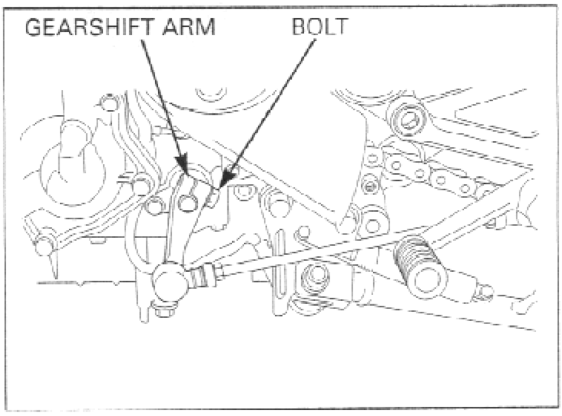
SHOCK LINK LOWER BRACKET REMOVAL

Remove the following:
- Muffler/exhaust pipe (page 2-19)
- Throttle body (page 5-62)

Disconnect the side stand switch 2P (Green) connector.

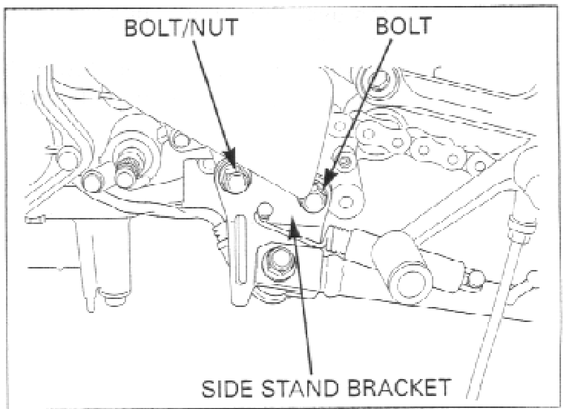


Remove the gearshift arm pinch bolt, then remove the gearshift arm from the gearshift spindle.

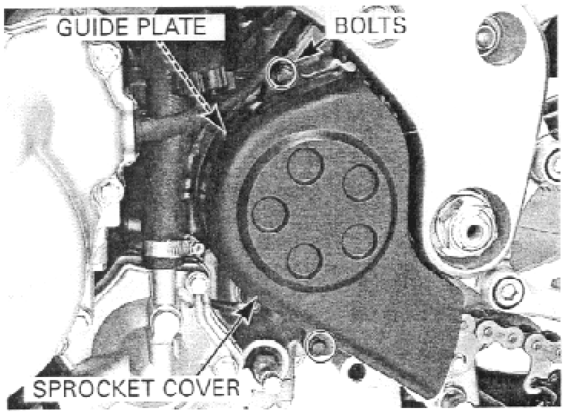


Remove the shock link lower bracket/side stand bracket mounting bolt/nut.

Remove the bolt and side stand bracket assembly.

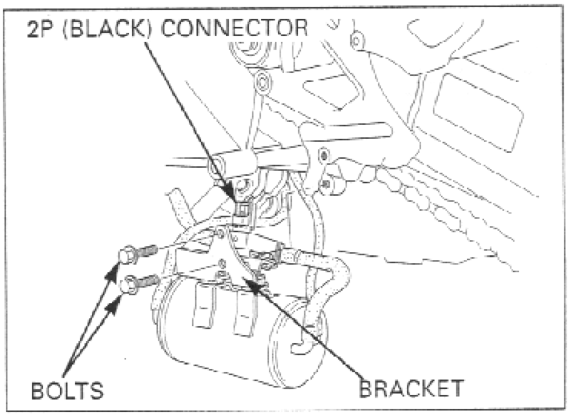


Remove the two bolts, drive sprocket cover and guide plate.

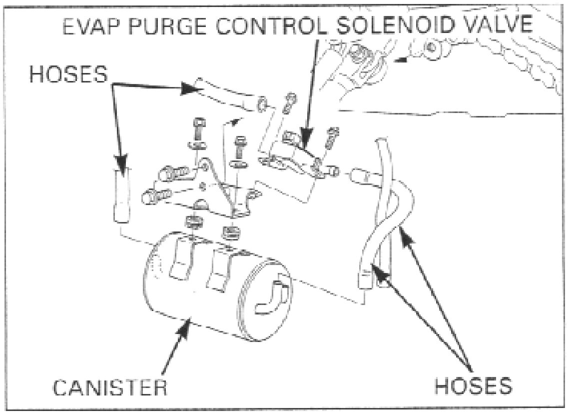


California type only: Remove the bolt and EVAP canister bracket assembly from the shock link bracket.

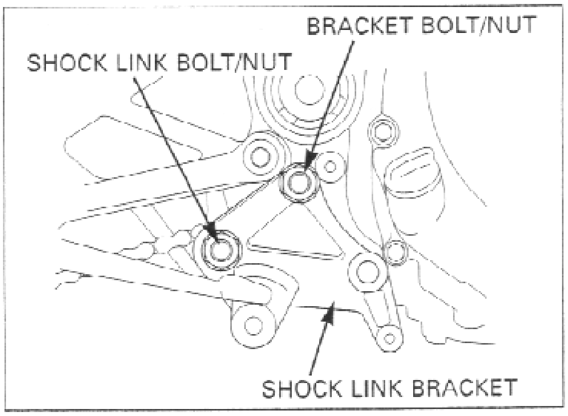
Disconnect the EVAP purge control solenoid valve 2P (Black) connector.



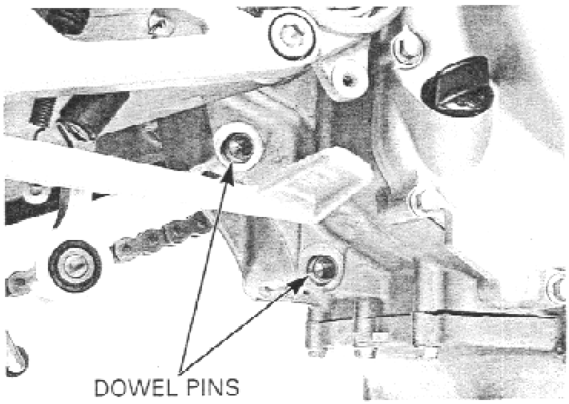
Disconnect the EVAP canister hoses and EVAP purge control solenoid valve hoses.



Remove the shock link lower mounting socket bolt/nut.
Remove the shock link lower bracket mounting bolt/nut, then remove the right and left lower brackets.



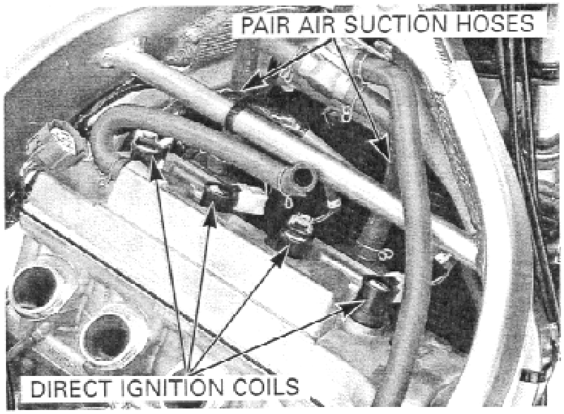
Remove the dowel pins.



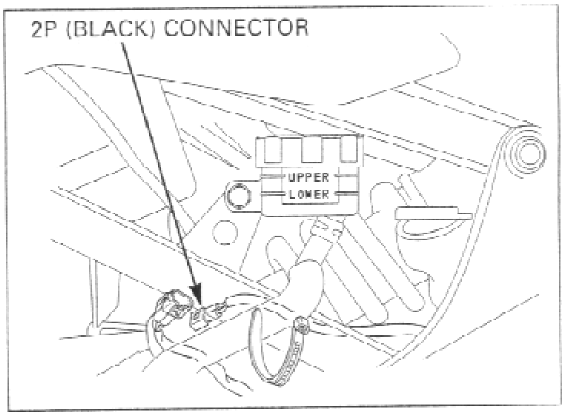
ENGINE REMOVAL

Remove the following:
- Fuel tank (page 5-55)
- Lower bracket (page 7-3)

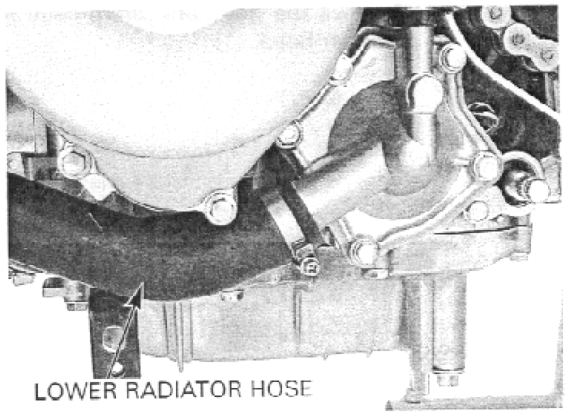
Disconnect the PAIR air suction hoses from the reed valve covers.
Disconnect the ignition coil connectors, then remove the direct ignition coils.



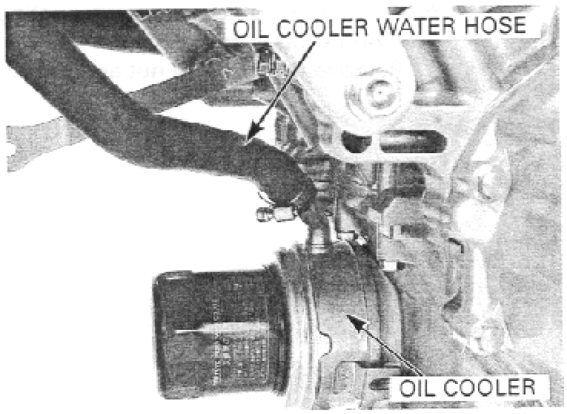
Remove the wire band and release the brake light wire from the seat rail.
Disconnect the brake light switch 2P (Black) connector.



Disconnect the lower radiator hose from the water pump cover.

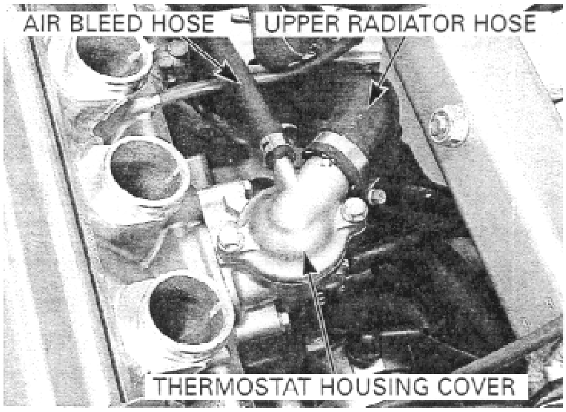


Disconnect the oil cooler water hose from the oil cooler.



Disconnect the air bleed hose and upper radiator hose from the thermostat housing cover.

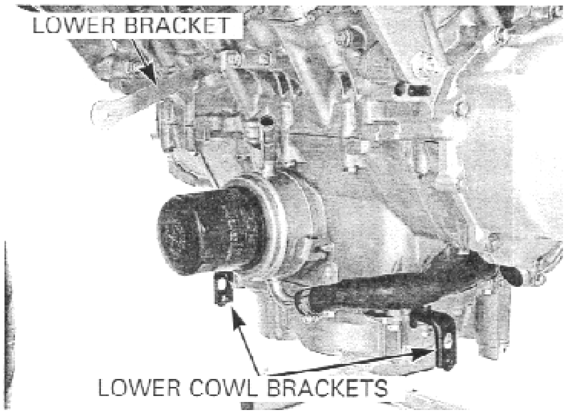
Remove the radiator (page 6-8).



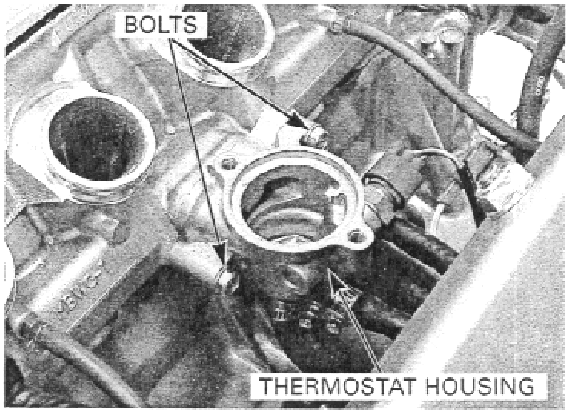
Remove the bolt and radiator lower bracket.

Avoid damaging the oil pan.

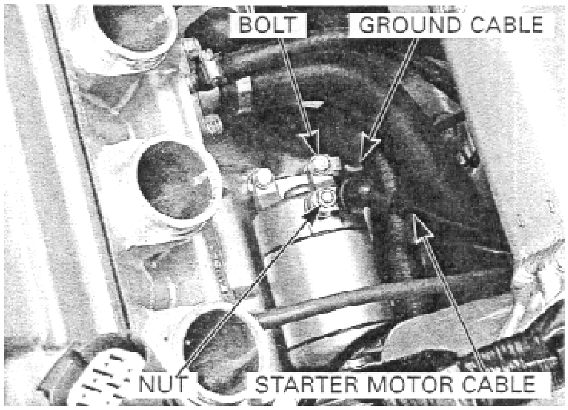
Remove the bolts and lower cowl brackets from the oil pan.



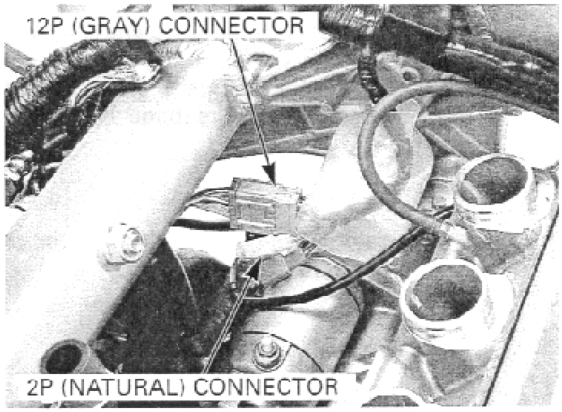
Remove the bolts and thermostat housing from the cylinder head.



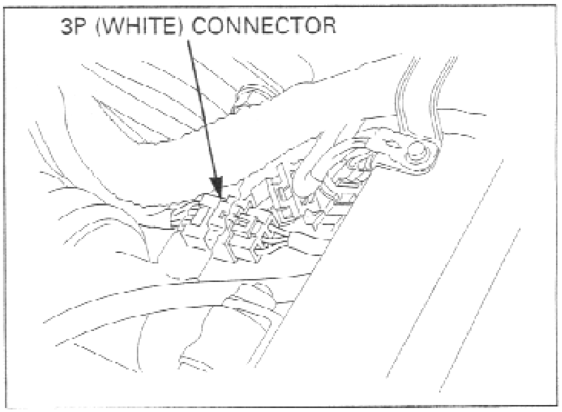
Remove the starter motor mounting bolt and starter motor ground cable.
Remove the terminal nut and starter motor cable.



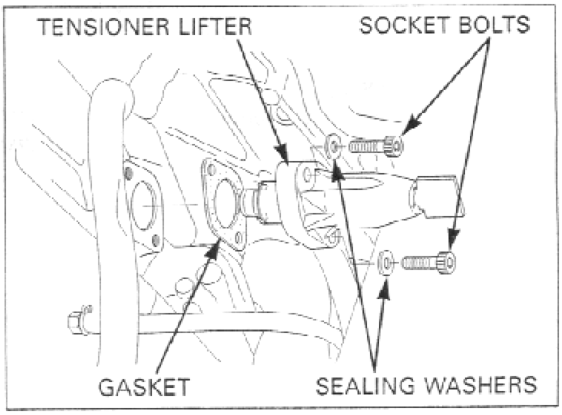
Disconnect the engine sub-harness 12P (Gray) and cam pulse generator 2P (Natural) connectors.



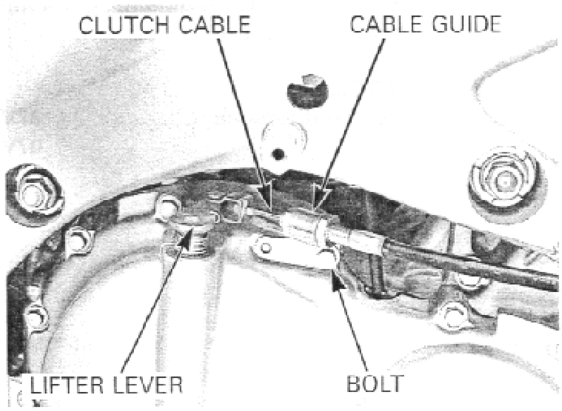
Disconnect the alternator 3P (White) connector.



Remove the socket bolts, sealing washers and cam chain tensioner lifter from the cylinder head.

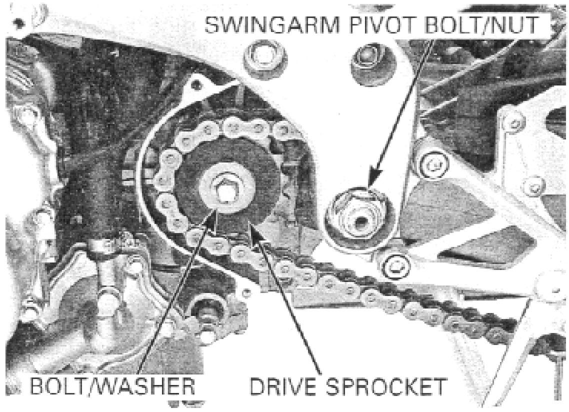


Remove the bolts and clutch cable guide, then disconnect the clutch cable from the clutch lifter lever.



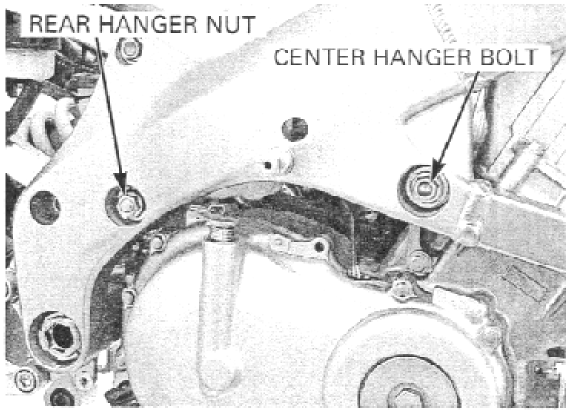
Remove the drive sprocket, washer and the drive sprocket with the drive chain from the countershaft.

Remove the swingarm pivot nut and bolt, then loosen the adjusting bolts (page 14-14).



Support the engine using a jack or another adjustable support to ease engine hanger bolt removal.

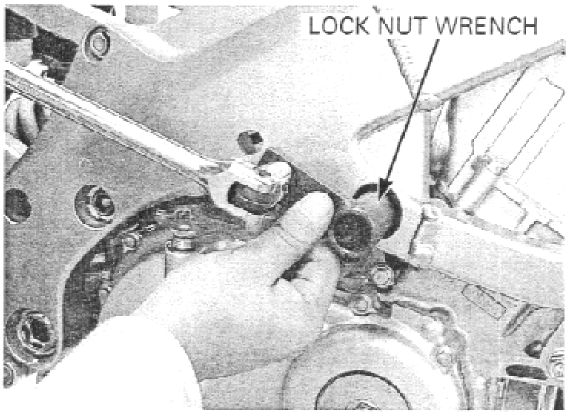
Remove the right side of the center hanger bolt.
Remove the right side of the rear hanger nut.



Loosen the center engine hanger adjusting bolt lock nut using the special tool.

TOOL:

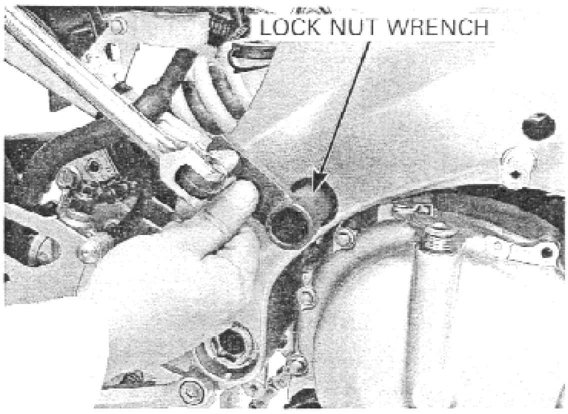
Lock nut wrench	**07VMA-MBB0100 or 07VMA-MBB0101**



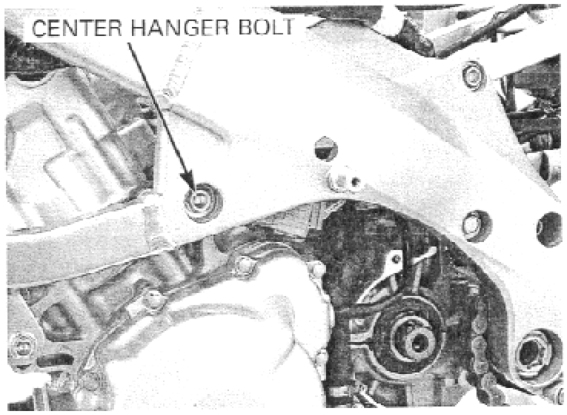
Loosen the rear engine hanger adjusting bolt lock nut using the special tool.

TOOL:

Lock nut wrench	**07VMA-MBB0100 or 07VMA-MBB0101**

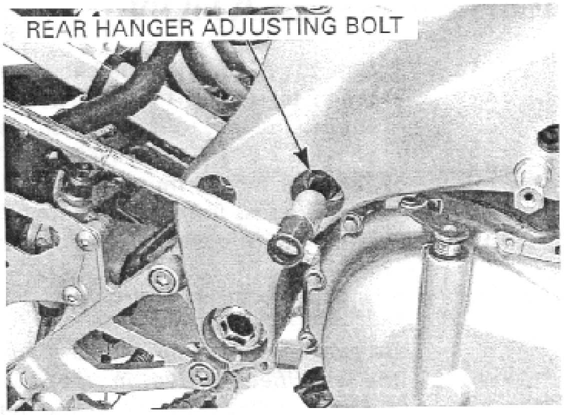


Remove the left side of the center hanger bolt.

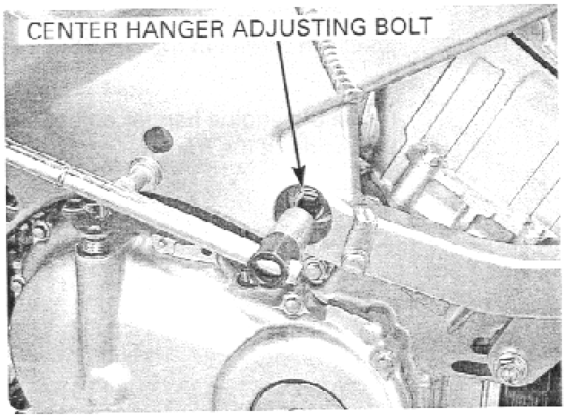


Push the right side of the rear hanger bolt until the adjusting bolt can be loosened.

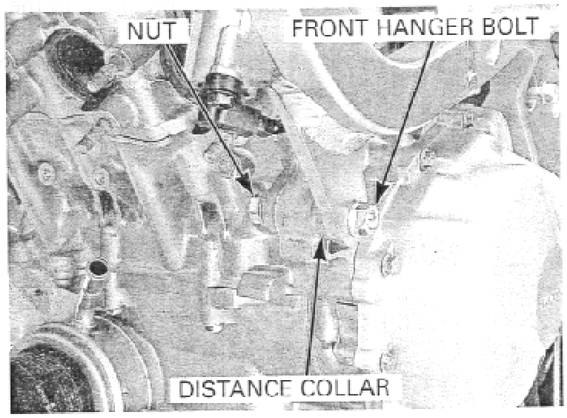
Loosen the rear hanger adjusting bolt.



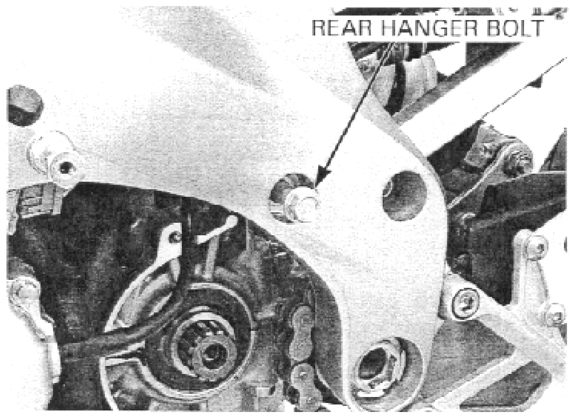
Loosen the center hanger adjusting bolt.



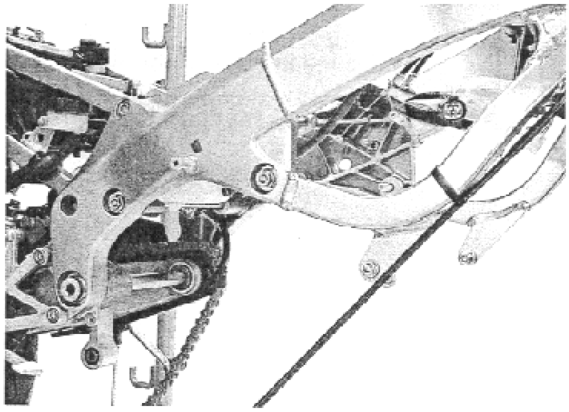
Remove the front engine hanger bolt and distance collar on both sides.



Remove the rear engine hanger bolt and distance collar, then remove the engine from the frame.



ENGINE INSTALLATION

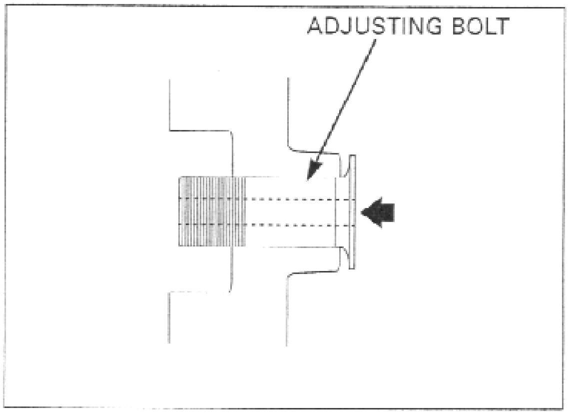


- Note the direction of the hanger bolts.
- When tightening the lock nut with the lock nut wrench, refer to torque wrench reading information on page 7-2 "SERVICE INFORMATION".
- The jack height must be continually adjusted to relieve stress from the mounting fasteners.
- Route the wire and cables properly (page 1-23).

NOTICE

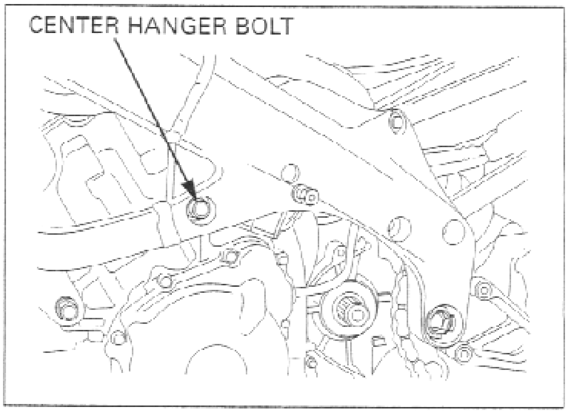
Be sure to tighten all engine mounting fasteners to the specified torque in the specified sequence described following page. If you make a mistake during the tightening torque or sequence, loosen all mounting fasteners, then tighten them again to the specified torque in the specified sequence.

Install the engine hanger adjusting bolts fully in from the inside of the frame.

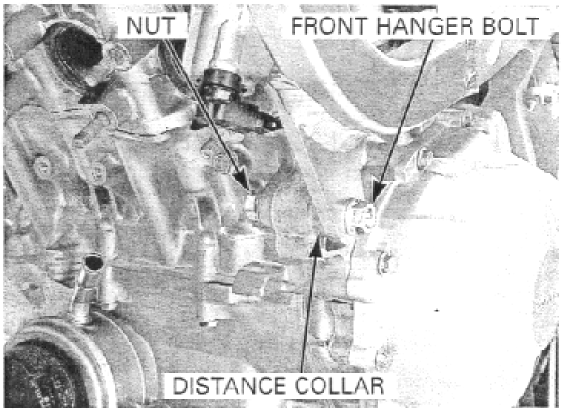


Carefully install the engine into the frame.

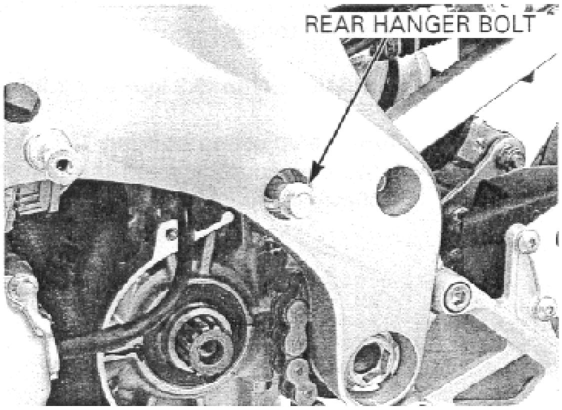
Install the left side of the center hanger bolt.



Install the front hanger distance collar and hanger bolt on both sides.

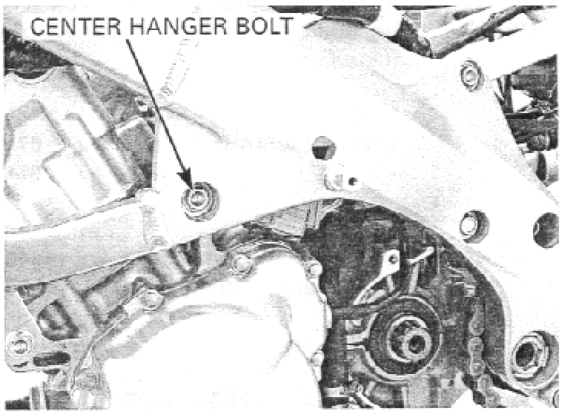


Install the rear engine hanger distance collars and temporarily install the rear engine hanger bolt from the left side.



Tighten the left side center hanger bolt to the specified torque.

TORQUE: 39 N•m (4.0 kgf•m, 29 lbf•ft)

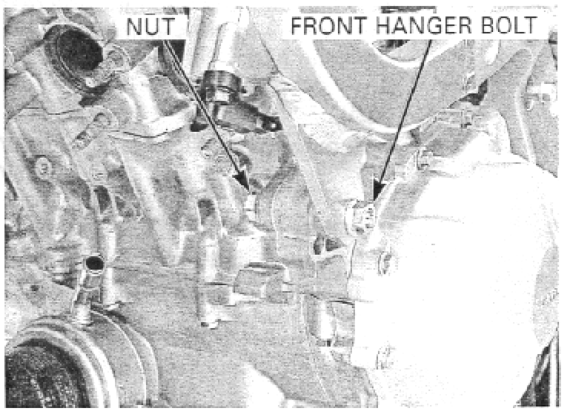


Tighten the left side front engine hanger bolt to the specified torque.

TORQUE: 39 N•m (4.0 kgf•m, 29 lbf•ft)

Tighten the right side front engine hanger bolt to the specified torque.

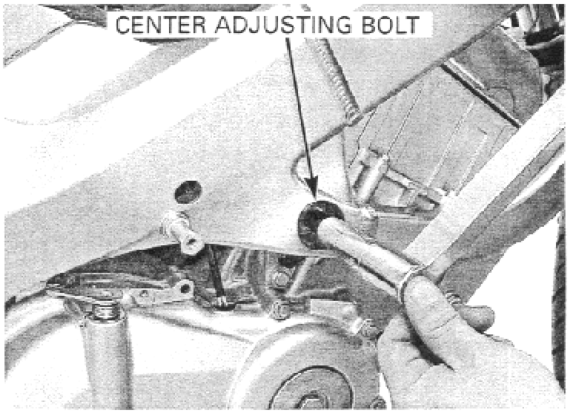
TORQUE: 39 N•m (4.0 kgf•m, 29 lbf•ft)



Tighten the right side center hanger adjusting bolt to the specified torque.

TORQUE: 3 N·m (0.3 kgf·m, 2.2 lbf·ft)

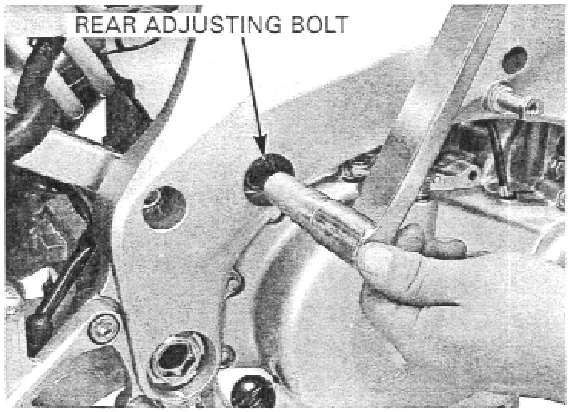
Turn the adjusting bolt out 180° and check that there is no clearance between the adjusting bolt and the engine.



Tighten the right side rear hanger adjusting bolt to the specified torque.

TORQUE: 3 N·m (0.3 kgf·m, 2.2 lbf·ft)

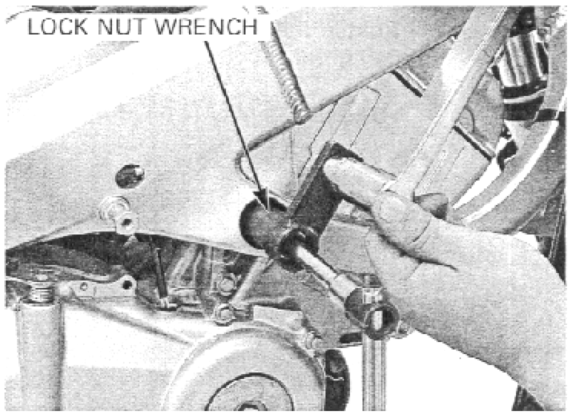
Turn the adjusting bolt out 180° and check that there is no clearance between the adjusting bolt and the distance collar.



Install and tighten the right side center hanger adjusting bolt lock nut to the specified torque, while holding the adjusting bolt.

TOOL:
Lock nut wrench **07VMA–MBB0100 or 07VMA–MBB0101**

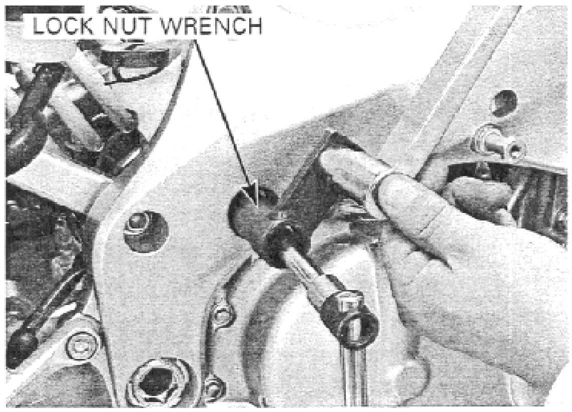
TORQUE:
Actual: 54 N·m (5.5 kgf·m, 40 lbf·ft)
Indicated: 49 N·m (5.0 kgf·m, 39 lbf·ft)



Install and tighten the right side rear hanger adjusting bolt lock nut to the specified torque, while holding the adjusting bolt.

TOOL:
Lock nut wrench **07VMA–MBB0100 or 07VMA–MBB0101**

TORQUE:
Actual: 54 N·m (5.5 kgf·m, 40 lbf·ft)
Indicated: 49 N·m (5.0 kgf·m, 39 lbf·ft)

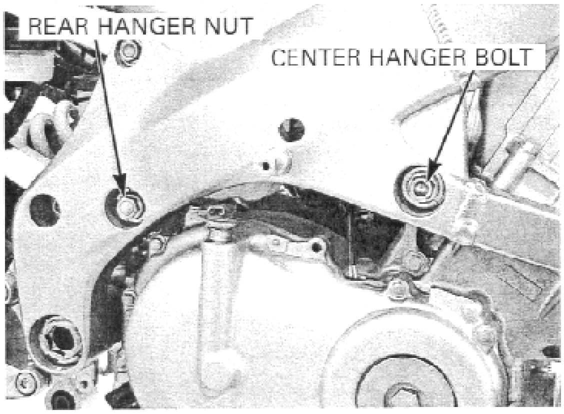


Install and tighten the right side center hanger bolt to the specified torque.

TORQUE: 39 N•m (4.0 kgf•m, 29 lbf•ft)

Fully install the rear engine hanger bolt.
Install and tighten the rear engine hanger nut to the specified torque.

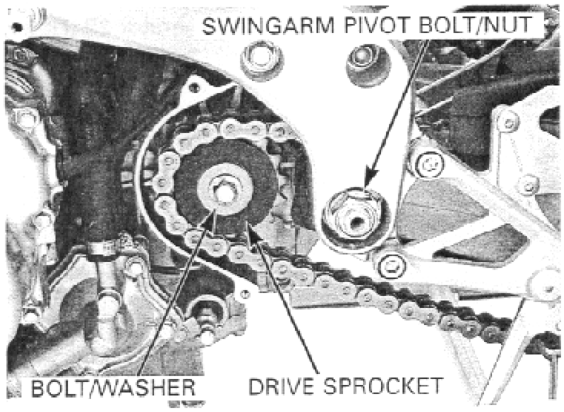
TORQUE: 39 N•m (4.0 kgf•m, 29 lbf•ft)



Install the swingarm between the engine and frame, install and tighten the pivot components (page 14-22).

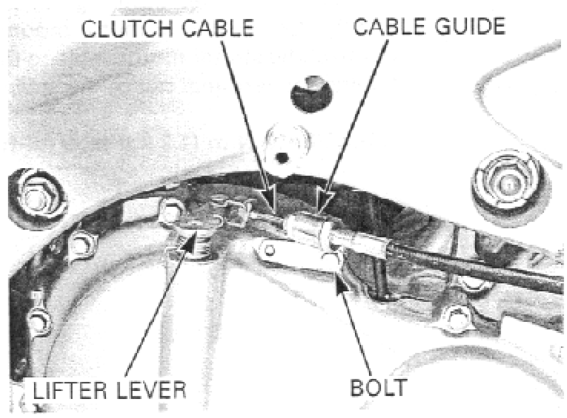
Install the drive sprocket with the drive chain onto the countershaft with the "MT4F" mark facing out.
Install the washer and bolt, tighten the bolt to the specified torque.

TORQUE: 54 N•m (5.5 kgf•m, 40 lbf•ft)



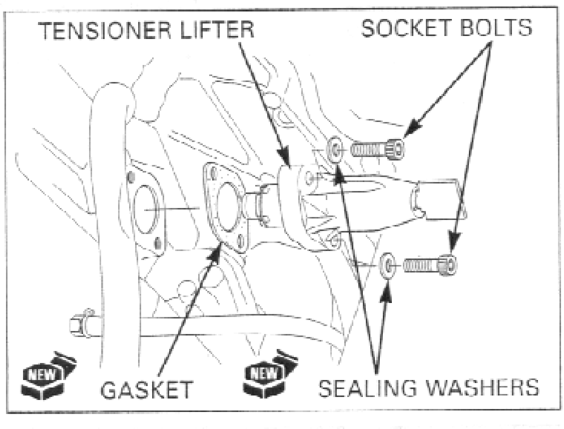
Connect the clutch cable to the clutch lifter lever.

Install the clutch cable guide to the right crankcase cover and tighten the mounting bolts securely.

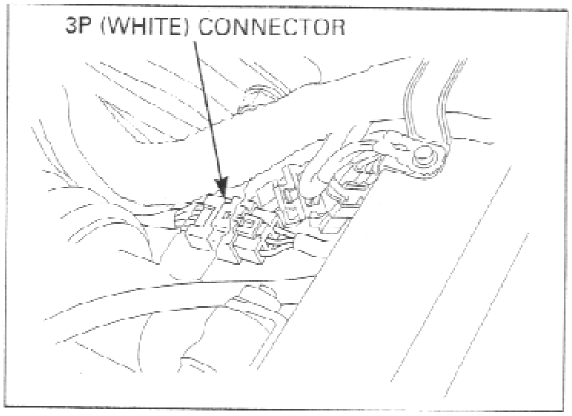


Install the cam chain tensioner lifter onto the cylinder head.
Install the sealing washers and bolts, tighten the bolts to the specified torque.

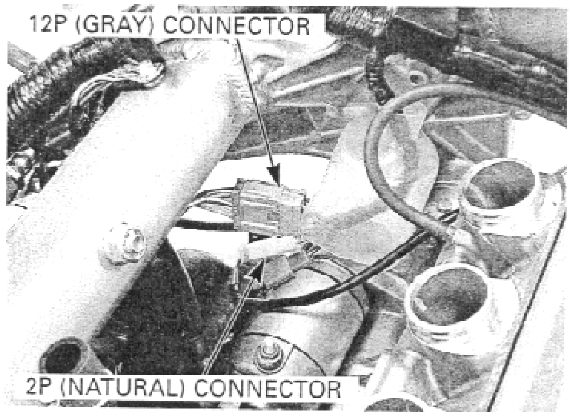
TORQUE: 10 N•m (1.0 kgf•m, 7 lbf•ft)



Route the alternator wire properly, connect the alternator 3P (White) connector.

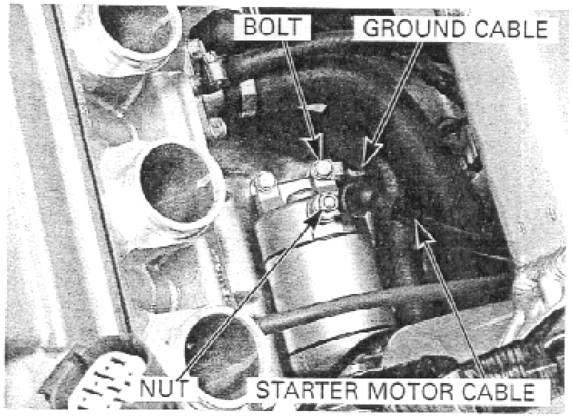


Connect the engine sub-harness 12P (Gray) connector and cam pulse generator 2P (Natural) connector.

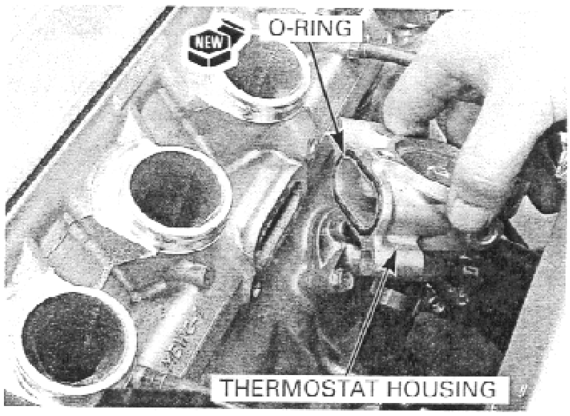


Connect the starter motor ground cable and install and tighten the starter motor mounting bolt.
Connect the starter motor cable to the motor terminal, tighten the terminal nut to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

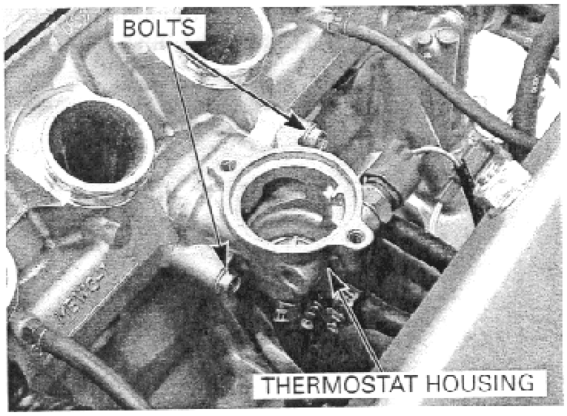


Install a new O-ring into the thermostat housing groove.
Install the thermostat housing to the cylinder head.



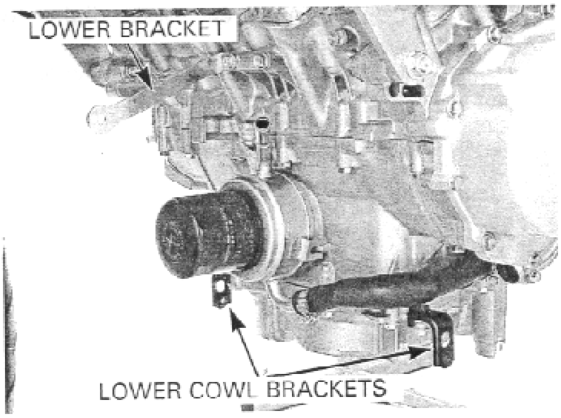
Install and tighten the thermostat housing mounting bolts.

Install the thermostat and thermostat housing cover (page 6-7).



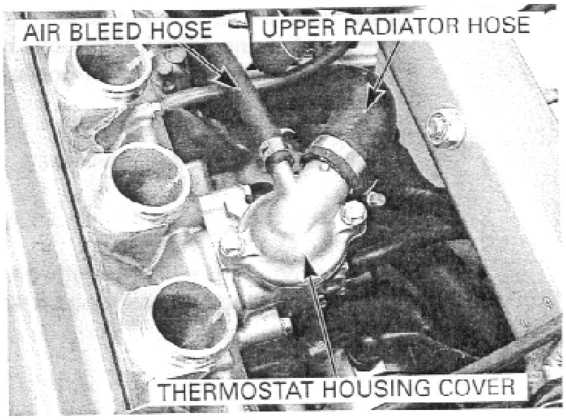
Install the lower cowl brackets onto the oil pan, tighten the bolts.

Install the radiator lower bracket to the cylinder block, tighten the bolts securely.

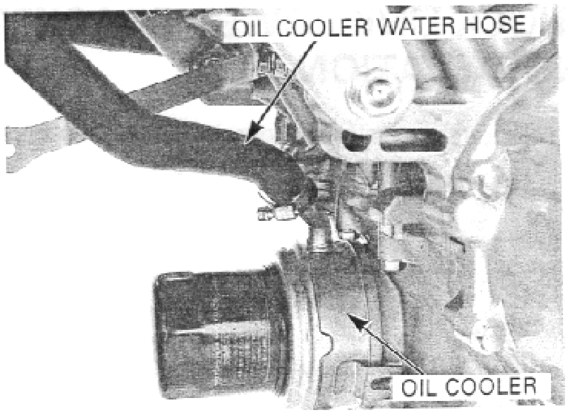


Install the radiator assembly (page 6-11).

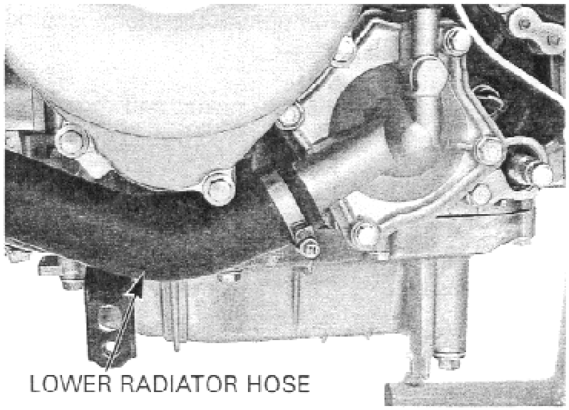
Connect the air bleed hose and upper radiator hose to the thermostat housing cover and tighten the hose band screw.



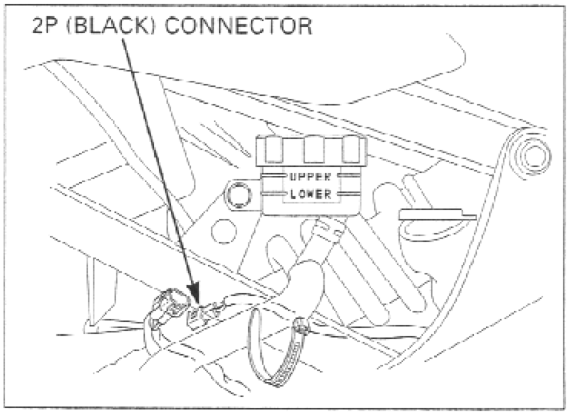
Connect the oil cooler water hose to the oil cooler, tighten the hose band screw securely.



Connect the lower radiator hose to the water pump cover and tighten the hose band screw securely.



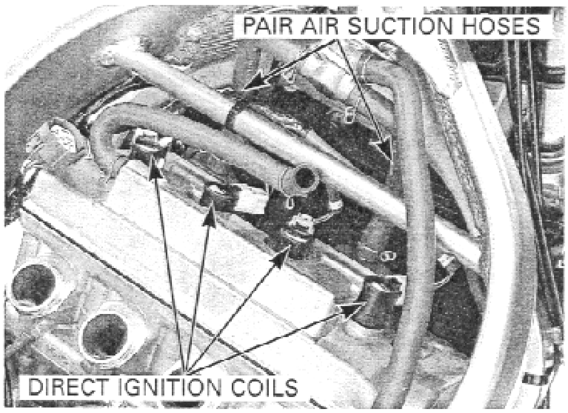
Connect the rear brake light switch 2P (Black) connector.
Clamp the brake light switch wire with the wire band.



Install the direct ignition coils into the spark plug holes and connect the ignition coil connectors.
Connect the PAIR air suction hoses to the reed valve covers.

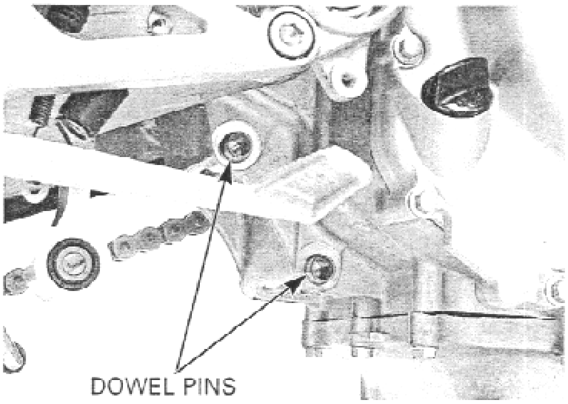
Install the fuel tank (page 5-57).

Add the recommended engine oil to the proper level (page 3-14).
Fill the cooling system with the recommended coolant and bleed any air (page 6-4).

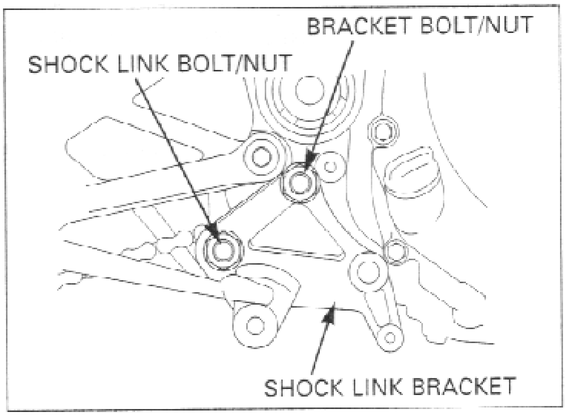


SHOCK LINK LOWER BRACKET INSTALLATION

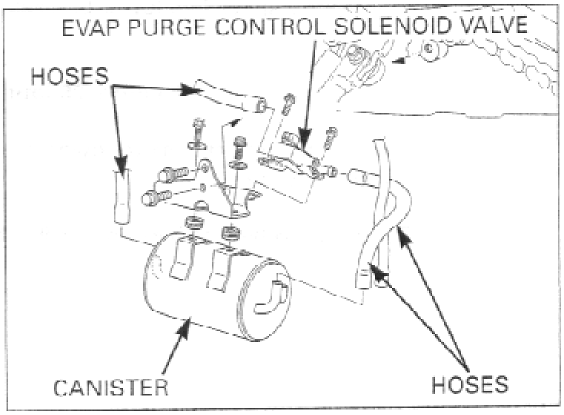
Install the four dowel pins into the shock link bracket bolt holes in the engine.



Install the right and left shock link lower brackets onto the engine.
Install the shock link lower bracket bolt and nut.
Install the shock link lower mounting socket bolt and nut.

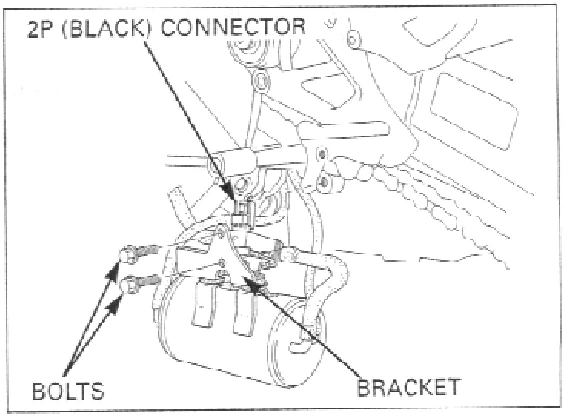


California type only: Connect the EVAP canister hose and EVAP purge control solenoid valve hoses.

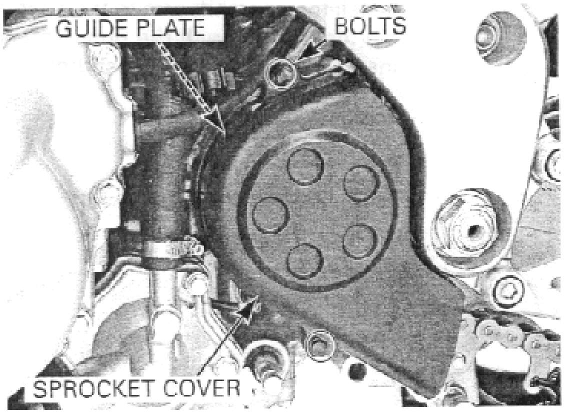


Connect the EVAP purge control solenoid valve 2P (Black) connector.

Install the EVAP canister bracket assembly to the shock link bracket and tighten the bolt securely.

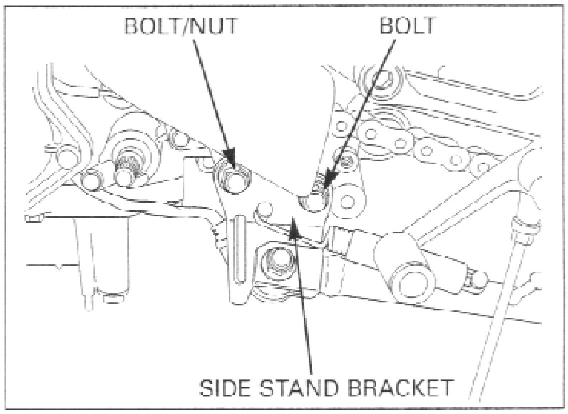


Install the drive chain guide plate and drive sprocket cover, tighten the bolts securely.



Install the side stand bracket and then install the side stand bracket/shock link lower bracket mounting bolt from the left side.
Install the nut.

Install the side stand bracket mounting bolt.

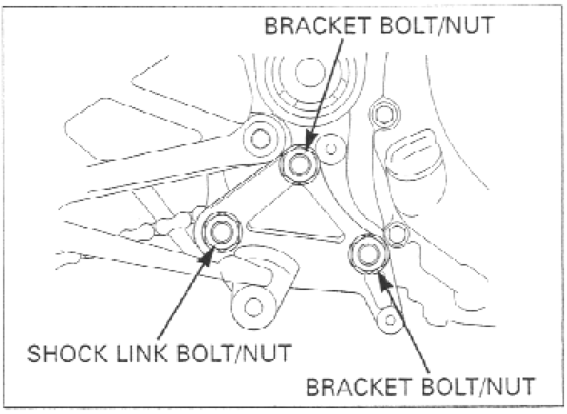


Tighten the shock link lower bracket nuts to the specified torque.

TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)

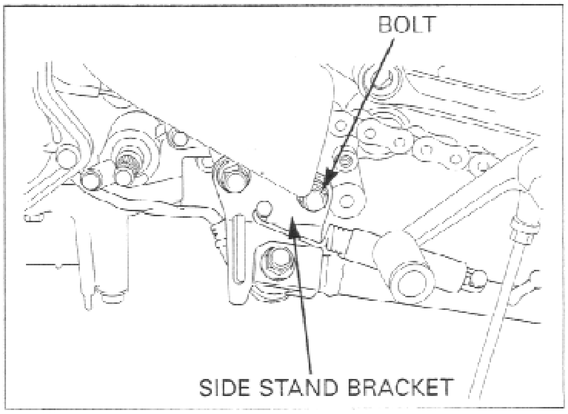
Tighten the shock link-to-lower bracket nut to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

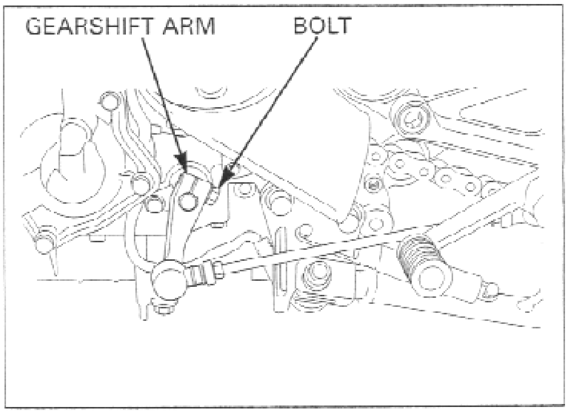


Tighten the side stand bracket bolt to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)



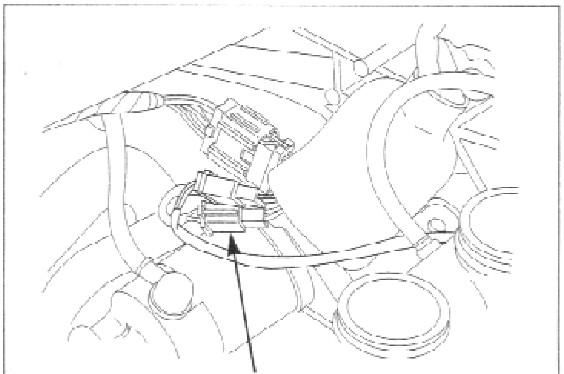
Install the gearshift arm to the gearshift spindle, aligning the arm slit with the punch mark on the spindle.
Install and tighten the pinch bolt.

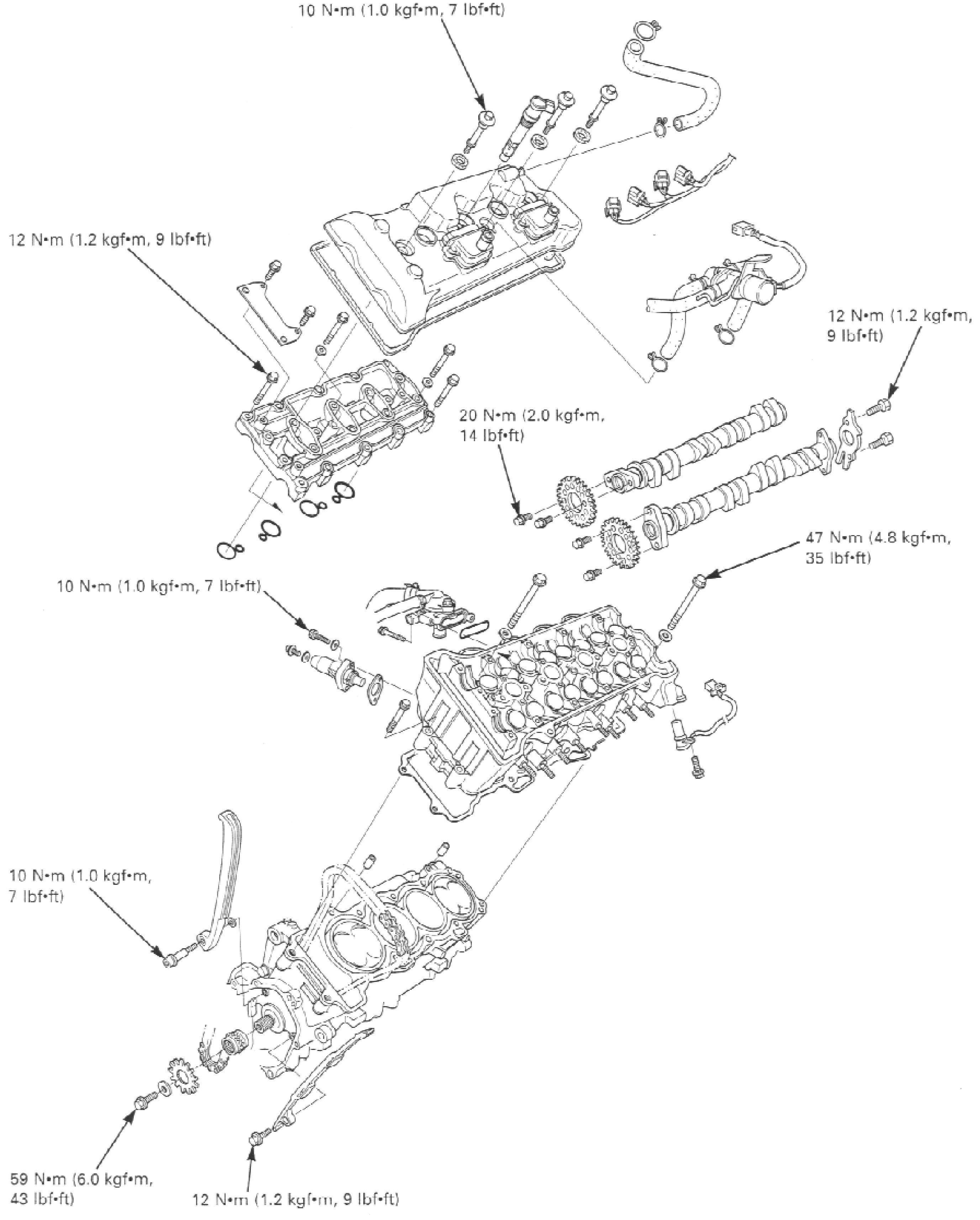


Route the side stand wire properly, connect the side stand switch 2P (Green) connector.

Install the following:
- Throttle body (page 5 66)
- Muffler/exhaust pipe (page 2-20)

Install the removed parts in the reverse order of removal.


2P (GREEN) CONNECTOR


10 N•m (1.0 kgf•m, 7 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)
12 N•m (1.2 kgf•m,
9 lbf•ft)
20 N•m (2.0 kgf•m,
14 lbf•ft)
47 N•m (4.8 kgf•m,
35 lbf•ft)
10 N•m (1.0 kgf•m, 7 lbf•ft)
10 N•m (1.0 kgf•m,
7 lbf•ft)
59 N•m (6.0 kgf•m,
43 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)

8. CYLINDER HEAD/VALVES

SERVICE INFORMATION

8

GENERAL

- This section covers service of the cylinder head, valves and camshaft.
- The camshaft service can be done with the engine installed in the frame. The cylinder head service requires engine removal.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling the cylinder head.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Cylinder compression			1,226 kPa (12.5 kgf/cm², 178 psi) at 350 rpm	—
Valve clearance		IN	0.20 ± 0.03 (0.008 ± 0.001)	—
		EX	0.28 ± 0.03 (0.011 ± 0.001)	—
Camshaft	Cam lobe height	IN	36.56 – 36.80 (1.439 – 1.449)	36.5 (1.44)
		EX	35.34 – 35.58 (1.391 – 1.401)	35.3 (1.39)
	Runout		—	0.05 (0.002)
	Oil clearance		0.030 – 0.072 (0.0012 – 0.0028)	0.10 (0.004)
Valve lifter	Valve lifter O.D.		25.978 – 25.993 (1.0228 – 1.0233)	25.97 (1.022)
	Valve lifter bore I.D.		26.010 – 26.026 (1.0240 – 1.0246)	26.04 (1.025)
Valve, valve guide	Valve stem O.D.	IN	3.975 – 3.990 (0.1565 – 0.1571)	3.965 (0.1561)
		EX	3.965 – 3.980 (0.1561 – 0.1567)	3.955 (0.1557)
	Valve guide I.D.	IN/EX	4.000 – 4.012 (0.1575 – 0.1580)	4.04 (0.159)
	Stem-to-guide clearance	IN	0.010 – 0.037 (0.0004 – 0.0015)	0.075 (0.0030)
		EX	0.020 – 0.047 (0.0008 – 0.0019)	0.085 (0.0033)
	Valve guide projection above cylinder head	IN	16.1 – 16.4 (0.63 – 0.65)	—
		EX	14.3 – 14.6 (0.56 – 0.57)	—
	Valve seat width	IN/EX	0.90 – 1.10 (0.035 – 0.043)	1.5 (0.06)
Valve spring free length	IN	Outer	42.2 (1.66)	41.36 (1.628)
		Inner	36.4 (1.43)	35.57 (1.400)
	EX		36.3 (1.43)	35.57 (1.400)
Cylinder head warpage			—	0.10 (0.004)

TORQUE VALUES

Cylinder head mounting bolt/washer	47 N•m (4.8 kgf•m, 35 lbf•ft)	Apply molybdenum disulfide oil to the threads and seating surface.
Camshaft holder flange bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply oil to the threads.
Cylinder head sealing bolt	18 N•m (1.8 kgf•m, 13 lbf•ft)	Apply a locking agent to the threads.
Cylinder head cover bolt	10 N•m (1.0 kgf•m, 7 lbf•ft)	
Breather plate flange bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads. CT bolt.
PAIR reed valve cover SH bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	CT bolt.
Cam sprocket flange dowel bolt	20 N•m (2.0 kgf•m, 14 lbf•ft)	Apply a locking agent to the threads.
Cam pulse generator rotor flange dowel bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads.
Cam chain lifter mounting socket bolt	10 N•m (1.0 kgf•m, 7 lbf•ft)	
Cam chain tensioner pivot socket bolt	10 N•m (1.0 kgf•m, 7 lbf•ft)	Apply a locking agent to the threads.
Cam chain guide bolt/washer	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Cylinder head stud bolt (exhaust pipe stud bolt)	See page 1-14	
Ignition pulse generator rotor special bolt	59 N•m (6.0 kgf•m, 43 lbf•ft)	

TOOLS

Compression gauge attachment	07RMJ–MY50100	Equivalent commercially available in U.S.A.
Valve spring compressor	07757–0010000	
Valve spring compressor attachment	07959–KM30101	
Tappet hole protector	07HMG–MR70002	
Valve guide driver	07JMD–KY20100	
Valve guide reamer, 4.008 mm	07MMH–KV90100	
Valve seat cutters		Equivalent commercially available in U.S.A.
Seat cutter, 27.5 mm (45° IN)	07780–0010200	
Seat cutter, 24.5 mm (45° EX)	07780–0010100	
Flat cutter, 27 mm (32° IN)	07780–0013300	
Flat cutter, 24 mm (32° EX)	07780–0012500	
Interior cutter, 26 mm (60° IN)	07780–0014500	
Interior cutter, 22 mm (60° EX)	07780–0014202	
Cutter holder, 4.0 mm	07781–0010500	

TROUBLESHOOTING

- Engine top-end problems usually affect engine performance. These problem can be diagnosed by a compression test or by tracing engine noises to the top-end with a sounding rod or stethoscope.
- If the performance is poor at low speeds, check for white smoke in the crankcase breather hose. If the hose is smoky, check for a seized piston ring (Section 12).

Compression too low, hard starting or poor performance at low speed
- Valves:
  - Incorrect valve adjustment
  - Burned or bent valve
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head:
  - Leaking or damaged head gasket
  - Warped or cracked cylinder head
- Worn cylinder, piston or piston rings (section 12)

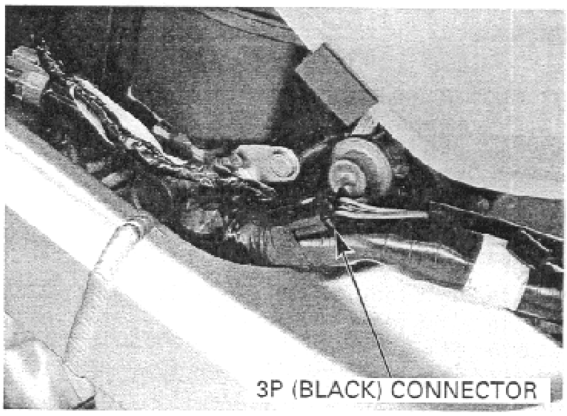
Compression too high, overheating or knocking
- Excessive carbon build-up on piston crown or on combustion chamber

Excessive smoke
- Cylinder head:
  - Worn valve stem or valve guide
  - Damaged stem seal
- Worn cylinder, piston or piston rings (section 12)

Excessive noise
- Cylinder head:
  - Incorrect valve adjustment
  - Sticking valve or broken valve spring
  - Damaged or worn camshaft
  - Loose or worn cam chain
  - Worn or damaged cam chain
  - Worn or damaged cam chain tensioner
  - Worn cam sprocket teeth
- Worn cylinder, piston or piston rings (section 12)

Rough idle
- Low cylinder compression

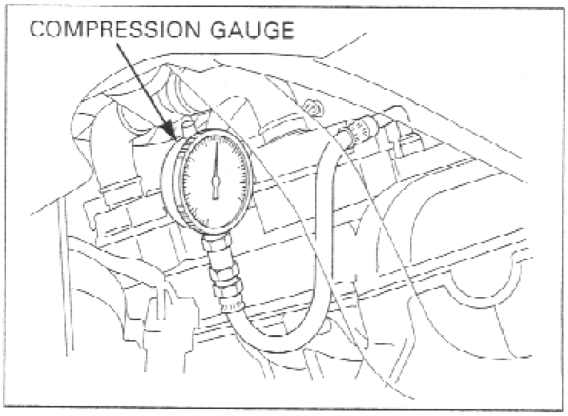
CYLINDER COMPRESSION TEST



Warm up the engine to normal operating temperature.
Stop the engine and remove all the direct ignition coil/spark plug caps and spark plugs (page 3-6).
Support the front end of fuel tank (page 3-4).

Disconnect the fuel pump/reserve sensor 3P (Black) connector.

Install a compression gauge into the spark plug hole.



TOOL:
Compression gauge attachment **07RMJ–MY50100 (equivalent commercially available in U.S.A.)**

Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising.

To avoid discharging the battery, do not operate the starter motor for more than 7 seconds.

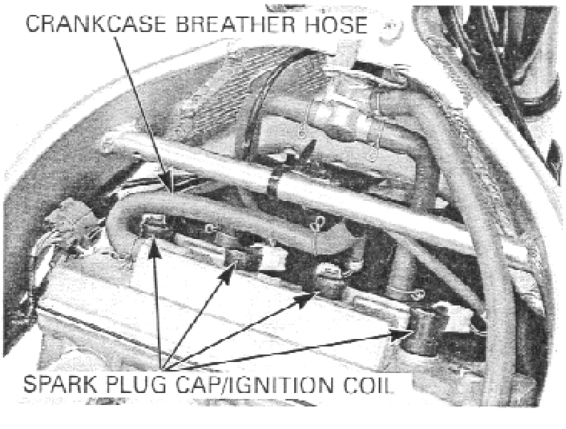
The maximum reading is usually reached within 4 – 7 seconds.

Compression pressure:
1,226 kPa (12.5 kgf/cm², 178 psi) at 350 rpm

Low compression can be caused by:
- Blown cylinder head gasket
- Improper valve adjustment
- Valve leakage
- Worn piston ring or cylinder

High compression can be caused by:
- Carbon deposits in combustion chamber or on piston head

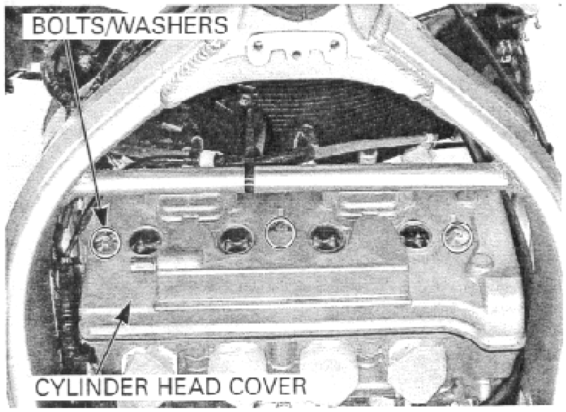
CYLINDER HEAD COVER REMOVAL



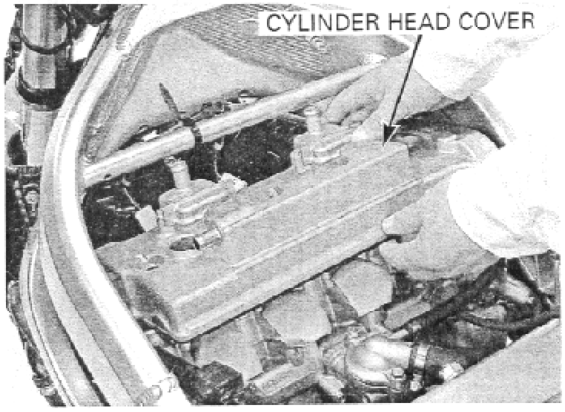
Remove the following:
- Throttle body (page 5-62)
- Spark plug cap/ignition coils (page 3-6)

Remove the crankcase breather hose.
Disconnect the PAIR air suction hoses from the PAIR reed valve covers.

Remove the cylinder head cover bolts and washers.

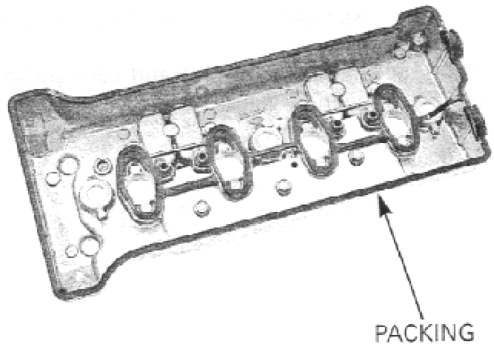


Remove the cylinder head cover rearward.

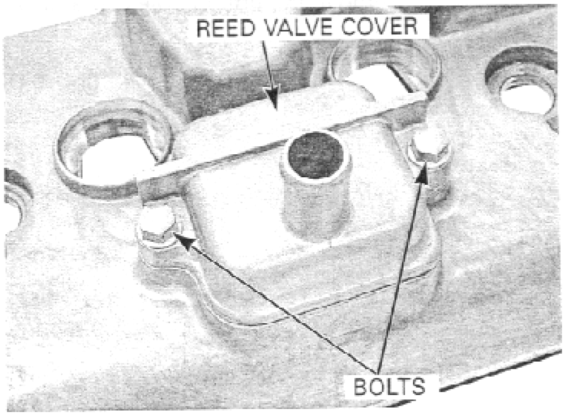


CYLINDER HEAD COVER DISASSEMBLY

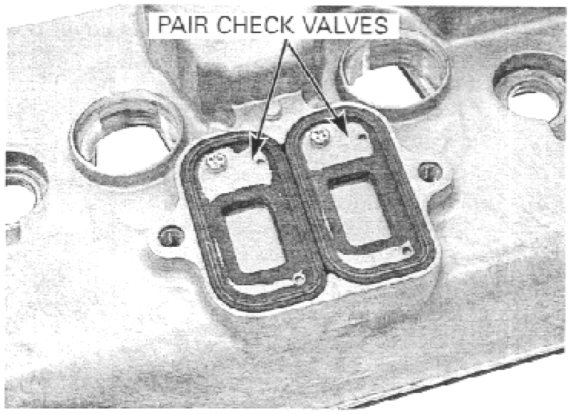
Remove the cylinder head cover packing.



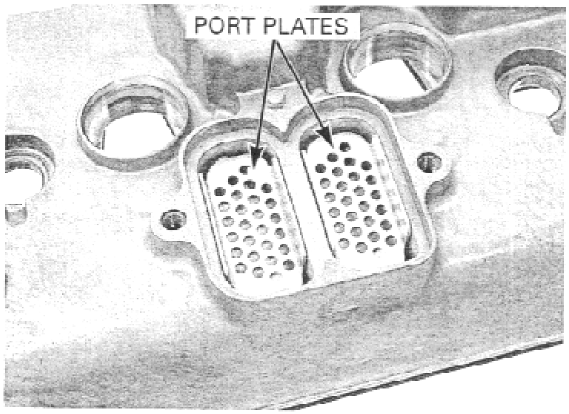
Remove bolts and breather separator and gasket



Check the PAIR check valve for wear or damage, replace if necessary.



Remove the port plates from the cylinder head cover.

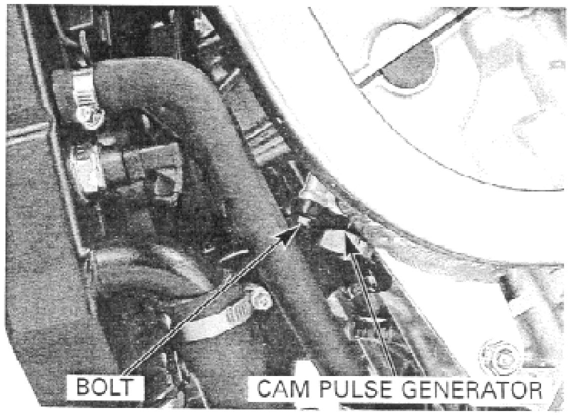


CAMSHAFT REMOVAL

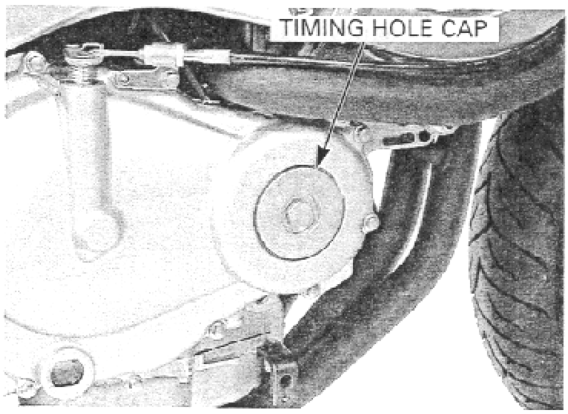
Remove the cylinder head cover (page 8-4).

Avoid damaging the cam pulse generator while removing the camshafts.

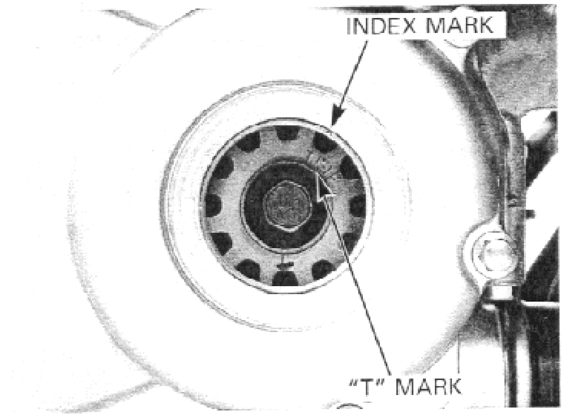
Remove the bolt and cam pulse generator from the cylinder head.



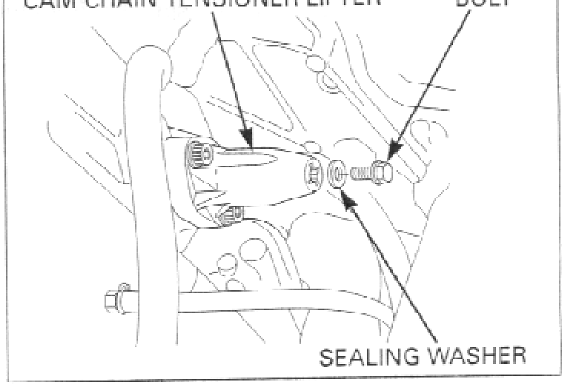
Remove the timing hole cap and O-ring.



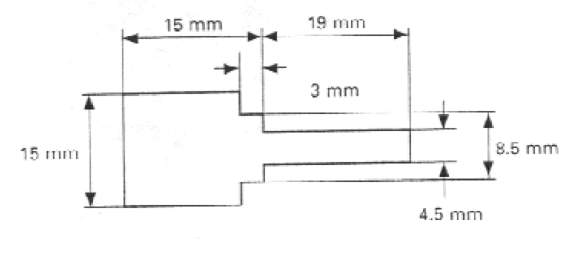
Turn the crankshaft clockwise, align the "T" mark on the ignition pulse generator rotor with the index mark on the right crankcase cover.
Make sure the No.1 piston is at TDC (Top Dead Center) on the compression stroke.



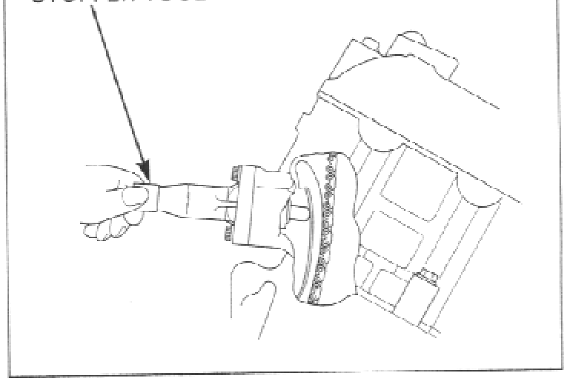
Remove the cam chain tensioner lifter sealing bolt and sealing washer.



Turn the tensioner lifter shaft fully in (clockwise) and secure it using the stopper tool.
This tool can easily be made from a thin (1 mm thickness) piece of steel.

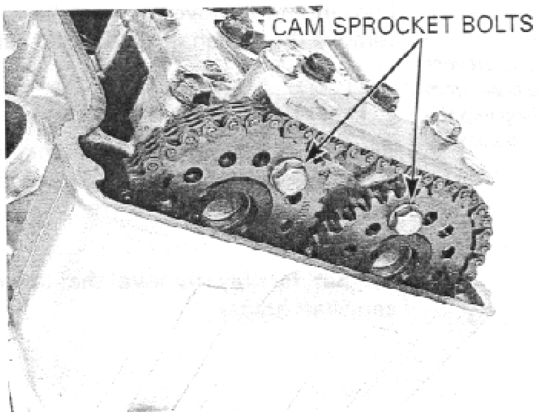


MATERIAL THICKNESS: 1.0 mm



It is not necessary to remove the cam sprocket from the camshaft except when replacing the camshaft and/or cam sprocket.

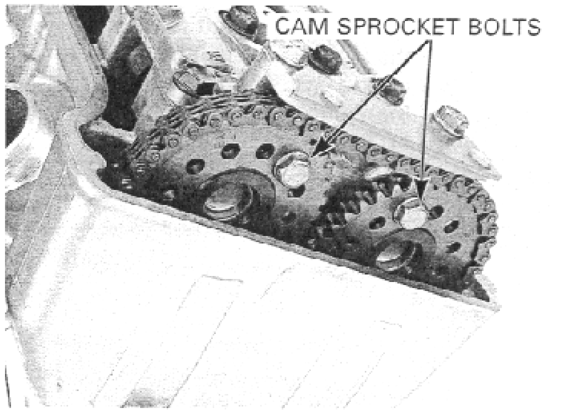
If you plan to replace the camshaft and/or cam sprocket, loosen the cam sprocket bolts as follow:



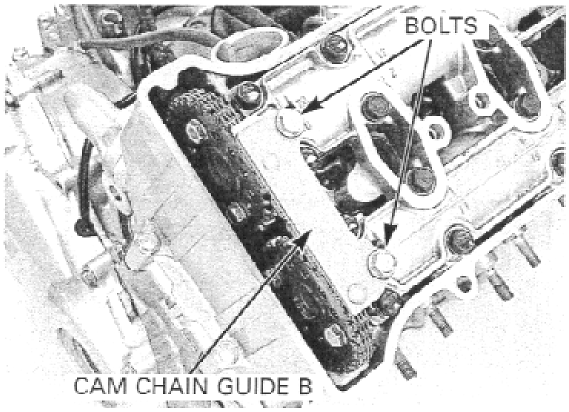
Be careful not to drop the cam sprocket bolts into the crankcase.

– Remove the cam sprocket bolts from the intake and exhaust camshafts.

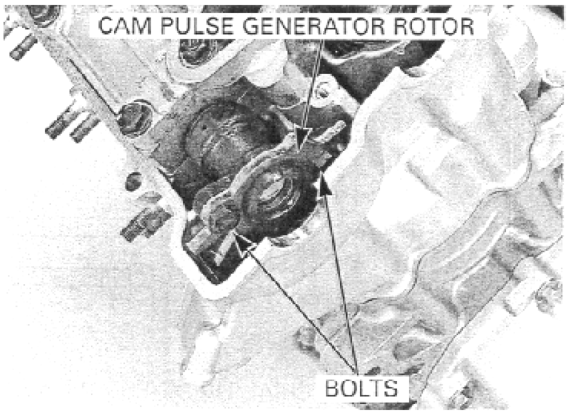
– Turn the crankshaft one full turn (360°), remove the other cam sprocket bolts from the camshafts.



– Remove the bolts and cam chain guide B.
– Remove the cam sprocket from the camshaft.



– Remove the bolts and cam pulse generator rotor.



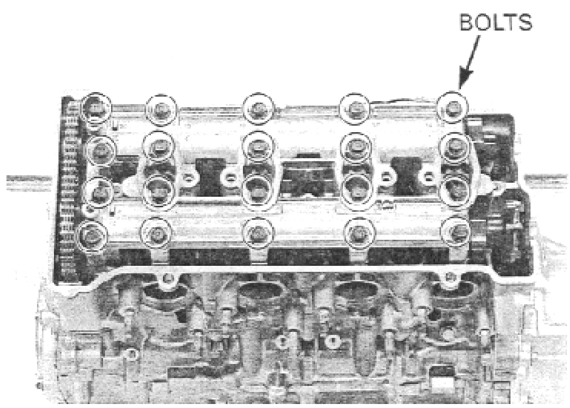
Suspend the cam chain with a piece of wire to prevent the chain from falling into the crankcase.

Loosen and remove the camshaft holder bolts, then remove the camshaft holder and camshaft.

NOTICE

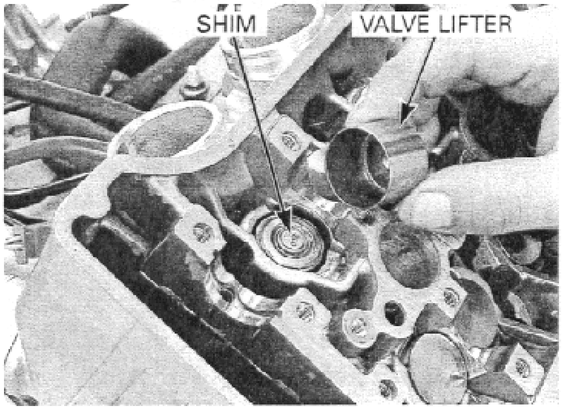
From outside to inside, loosen the bolts in a crisscross pattern in several steps or the camshaft holder might break.

Do not forcibly remove the dowel pins from the camshaft holder.



Remove the valve lifters and shims.

- Be careful not to damage the valve lifter bore.
- The shim may stick to the inside of the valve lifters. Do not allow the shims to fall into the crankcase.
- Mark all valve lifters and shims to ensure correct reassembly in their original locations.
- The valve lifter can be easily removed with a valve lapping tool or magnet.
- The shims can be easily removed with a tweezers or magnet.

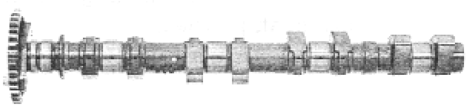


INSPECTION

CAMSHAFT

Check the cam and journal surfaces of the camshaft for scoring, scratches or evidence of insufficient lubrication.

Check the oil holes in the camshaft for clogs.

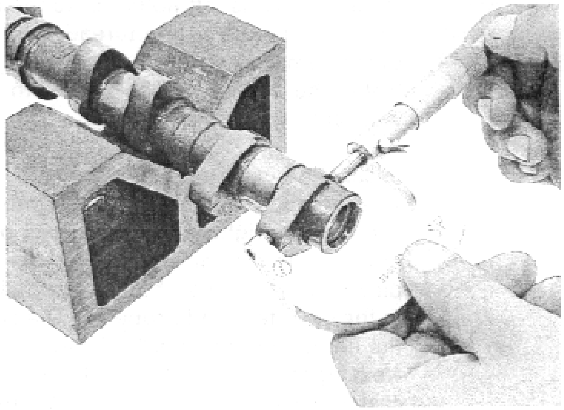


Support both ends of the camshaft with V-blocks and check the camshaft runout with a dial gauge.

SERVICE LIMIT: 0.05 mm (0.002 in)

Using a micrometer, measure each cam lobe height.

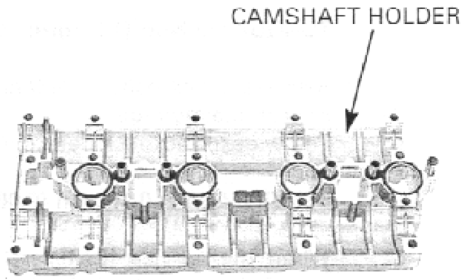
SERVICE LIMITS:
IN: 36.5 mm (1.44 in)
EX: 35.3 mm (1.39 in)



CAMSHAFT HOLDER

Inspect the bearing surface of the camshaft holder for scoring, scratches, or evidence of insufficient lubrication.

Inspect the oil orifices of the holders for clogs.



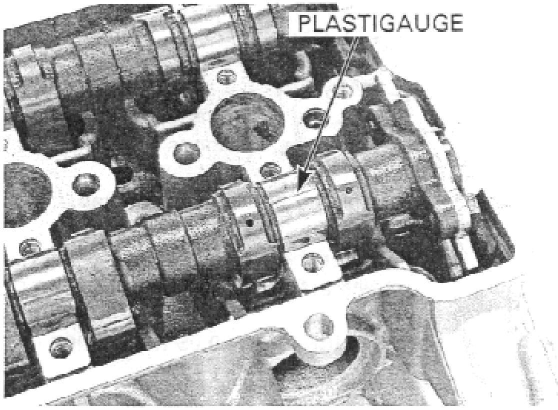
CAM CHAIN GUIDE B

Inspect the cam chain slipper surface of the cam chain guide for wear or damage.

CAMSHAFT OIL CLEARANCE

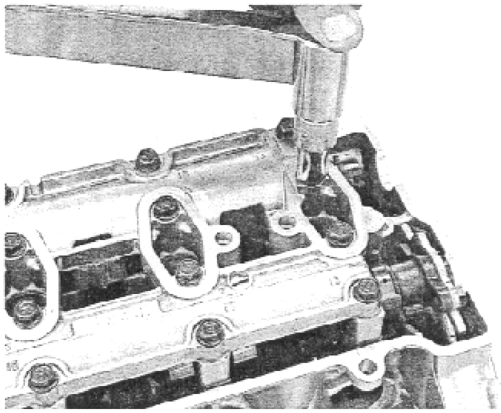
Remove the cylinder head and valves (page 8-11).

Wipe any oil from the journals of the camshaft, cylinder head and camshaft holders.
Lay a strip of plastigauge lengthwise on top of each camshaft journal.



Do not rotate the camshaft when using plastigauge.

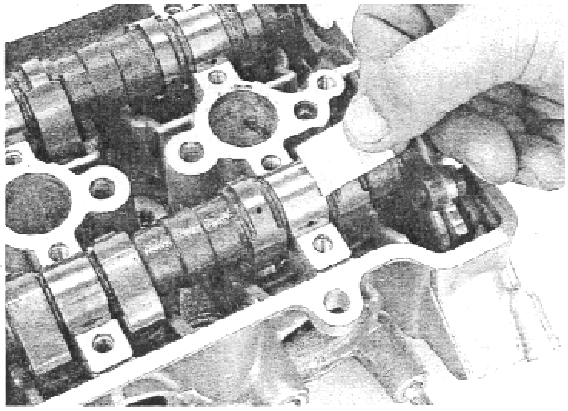
Install the camshaft holder onto the camshafts.
Apply engine oil to the threads and seating surfaces of the camshaft holder bolts.
Install the twenty holder bolts with the eight sealing washers.



In case the valves in cylinder head:
The camshaft holder have the number "1 thru 20".
Temporarily tighten the four bolts of the center area gradually in the sequence 6 – 5 – 8 – 7 until the dowel pins on the camshaft holder inserts into the pin holes in the cylinder head properly. (The clearance between the holder and head is 1 – 5 mm)
Next tighten the all holder bolts in numerical order cast on the camshaft holder (1 thru. 20) in several steps, then tighten them to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Remove the camshaft holders and measure the width of each plastigauge.
The widest thickness determines the oil clearance.



SERVICE LIMIT: 0.10 mm (0.004 in)

When the service limits are exceeded, replace the camshaft and recheck the oil clearance.
Replace the cylinder head and camshaft holders as a set if the clearance still exceeds the service limit.

CYLINDER HEAD REMOVAL

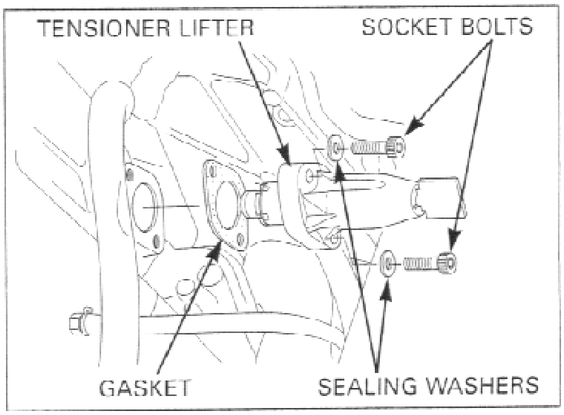
Drain the coolant (page 6-5).

Remove the following:
- Camshaft (page 8-6)
- Thermostat housing (page 6-6)

Remove the cylinder drain bolt and sealing washer.
Drain the coolant from the cylinder head and cylinder block.

Check the sealing washer is in good condition, replace if necessary.
Reinstall the sealing washer and drain bolt.

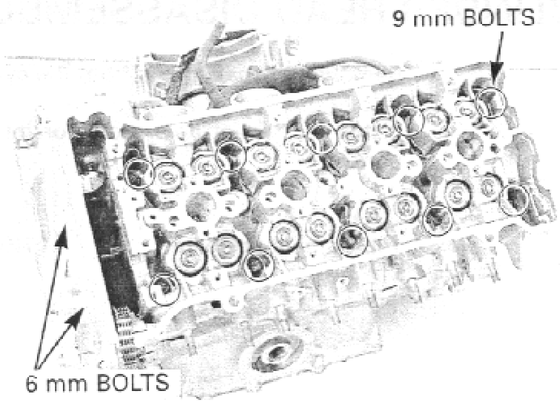
Remove the socket bolts, sealing washers and cam chain tensioner lifter and gasket.



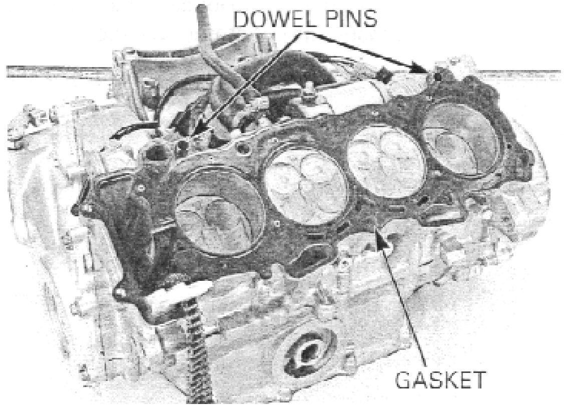
Loosen the 9-mm bolts in a criss-cross pattern in two or three steps.

Remove the two 6-mm flange bolts.
Remove the ten 9-mm bolts/washers.

Remove the cylinder head.

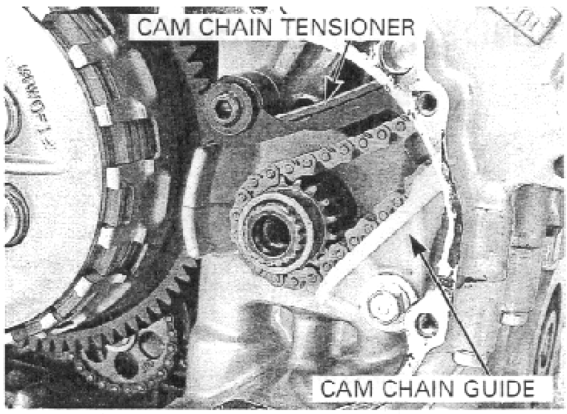


Remove the gasket and dowel pins.

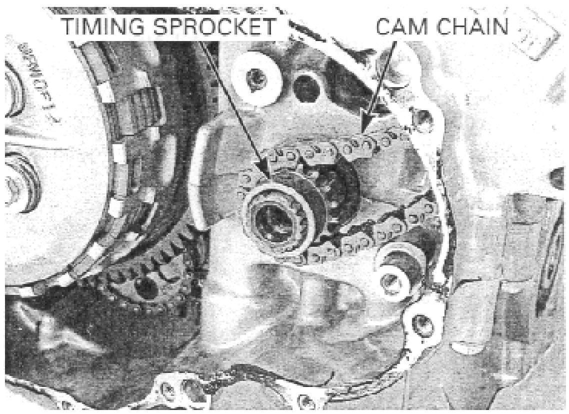


Remove the right crankcase cover and ignition pulse generator rotor (page 17-7).

Remove the socket bolt, washer, cam chain guide and collar.
Remove the socket bolt, cam chain tensioner and washer.



Remove the cam chain and timing sprocket from the crankshaft.

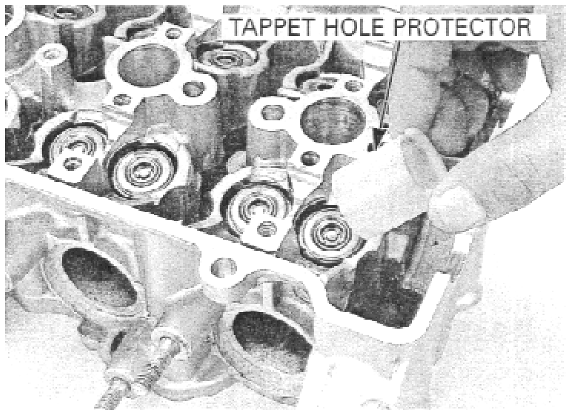


CYLINDER HEAD DISASSEMBLY

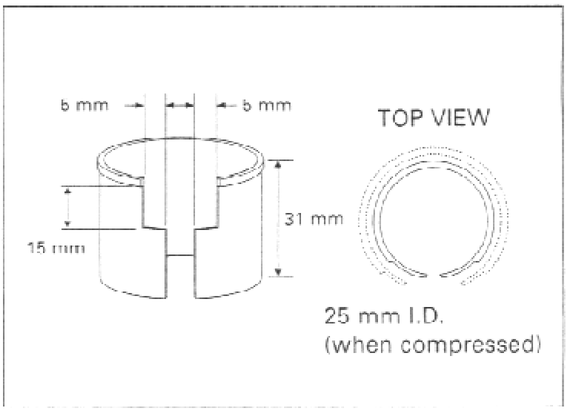
Remove the spark plugs from the cylinder head.

Install the tappet hole protector into the valve lifter bore.

TOOL:
Tappet hole protector **07HMG–MR70002**



An equivalent tool can easily be made from a 35-mm plastic film container as shown.

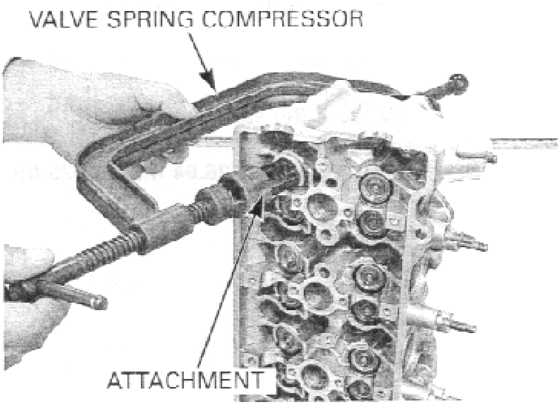


Remove the valve spring cotters using the special tools as shown.

TOOLS:
Valve spring compressor 07757-0010000
Valve spring compressor attachment 07959-KM30101

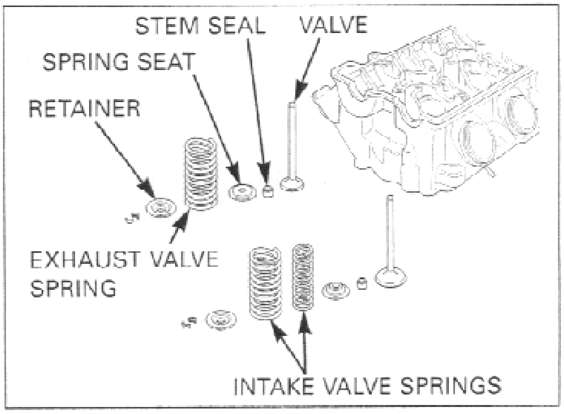
NOTICE

To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.



Mark all parts during disassembly so they can be placed back in their original locations.

Remove the following:
- Spring retainer
- Valve spring
- Valve
- Stem seal
- Valve spring seat

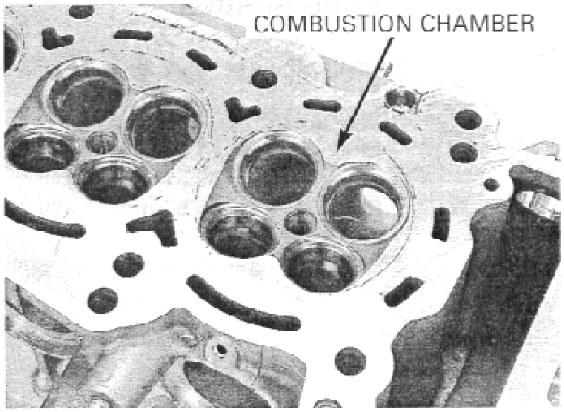


CYLINDER HEAD INSPECTION

CYLINDER HEAD

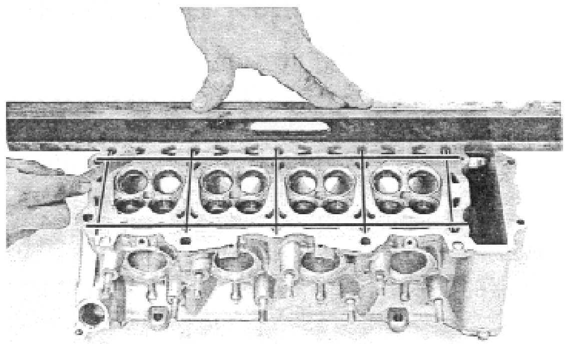
Avoid damaging the gasket surface.

Remove carbon deposits from the combustion chamber, being careful not to damage the gasket surface. Check the spark plug hole and valve areas for cracks.



Check the cylinder head for warpage with a straight edge and feeler gauge.

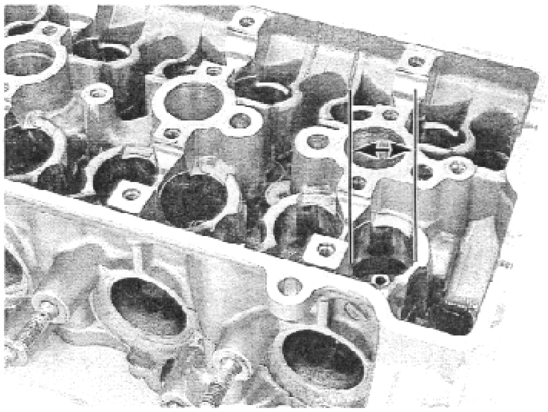
SERVICE LIMIT: 0.10 mm (0.004 in)



VALVE LIFTER BORE

Inspect each valve lifter bore for scratches or abnormal wear.
Measure the each valve lifter bore I.D.

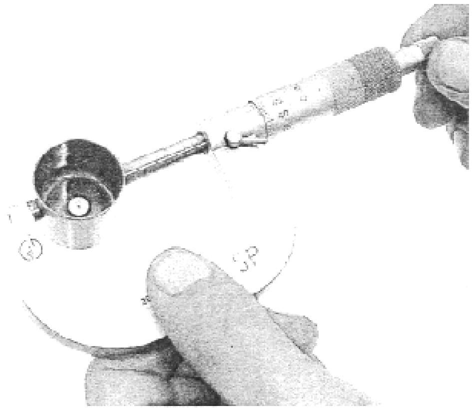
SERVICE LIMIT: 26.04 mm (1.025 in)



VALVE LIFTER

Inspect each valve lifter for scratches or abnormal wear.
Measure the each valve lifter O.D.

SERVICE LIMIT: 25.97 mm (1.022 in)

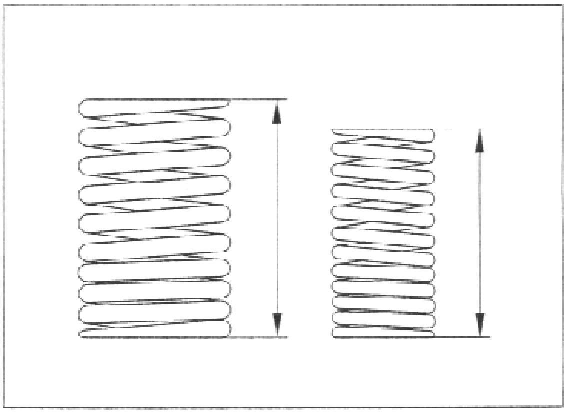


VALVE SPRING

Measure the the valve spring free length.

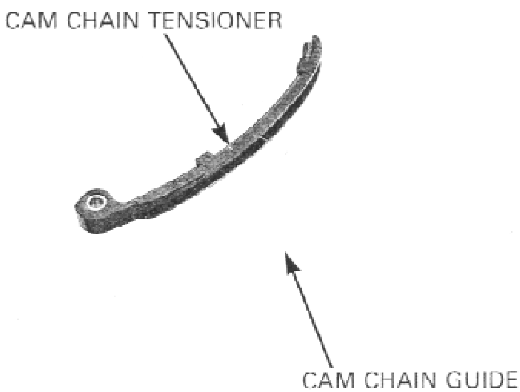
SERVICE LIMITS:
Intake: Outer: 41.36 mm (1.628 in)
Inner: 35.57 mm (1.400 in)
Exhaust: 35.57 mm (1.400 in)

Replace the springs if they are shorter than the service limits.



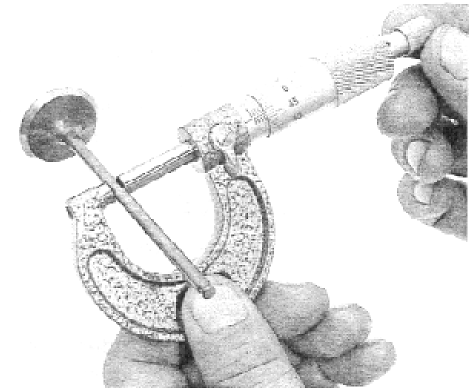
CAM CHAIN TENSIONER/CAM CHAIN GUIDE

Inspect the cam chain tensioner and cam chain guide for excessive wear or damage, replace if necessary.



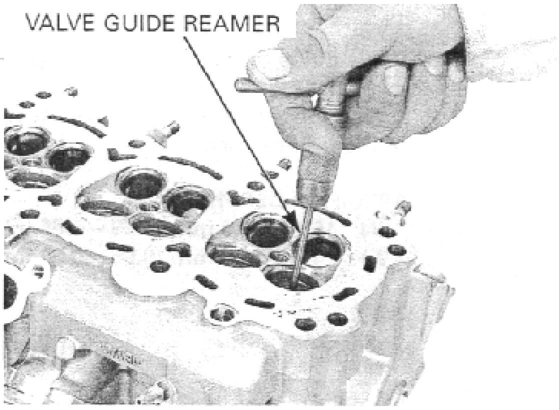
VALVE/VALVE GUIDE

Check that the valve moves smoothly in the guide.
Inspect each valve for bends, burns or abnormal stem wear.
Check valve movement in the guide, measure and record each valve stem O.D.



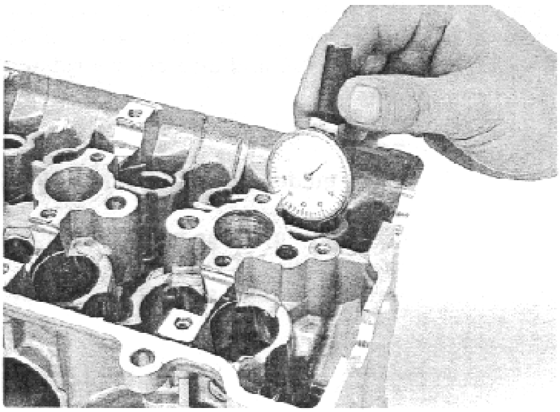
SERVICE LIMITS:
IN: 3.965 mm (0.1561 in)
EX: 3.955 mm (0.1557 in)

Ream the guides to remove any carbon deposits before checking clearances.
Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.



TOOL:
Valve guide reamer, 4.008 mm 07MMH–MV90100

Measure and record each valve guide I.D.



SERVICE LIMIT: IN/EX: 4.04 mm (0.159 in)

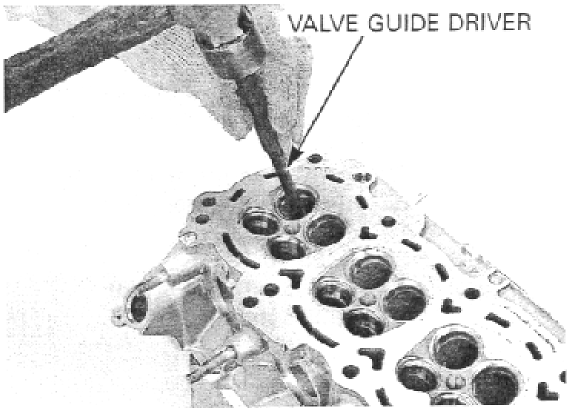
Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

SERVICE LIMITS:
IN: 0.075 mm (0.0030 in)
EX: 0.085 mm (0.0033 in)

Reface the valve seats whenever the valve guides are replaced (page 8-17).

If the stem-to-guide clearance is out of standard, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace any guides as necessary and ream to fit.
If the stem-to-guide clearance is out of standard with the new guides, replace the valves and guides.

VALVE GUIDE REPLACEMENT



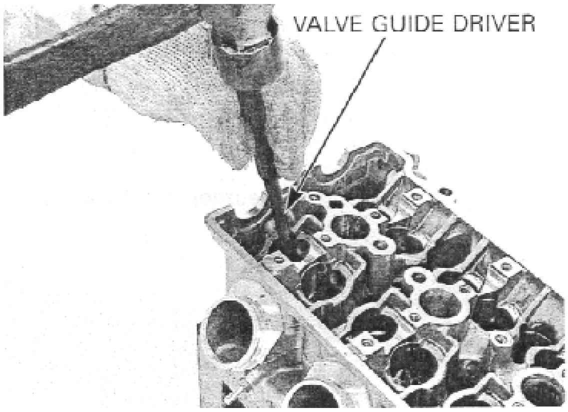
Chill the replacement valve guides in a freezer for about an hour.
Heat the cylinder head to 100 – 150°C (212 – 300°F) with a hot plate or oven.

NOTICE

Do not use a torch to heat the cylinder head; it may cause warpage.

Support the cylinder head and drive out the valve guides from combustion chamber side of the cylinder head.

TOOL:
Valve guide driver **07JMD–KY20100**



Drive in the guide to the specified depth from the top of the cylinder head.

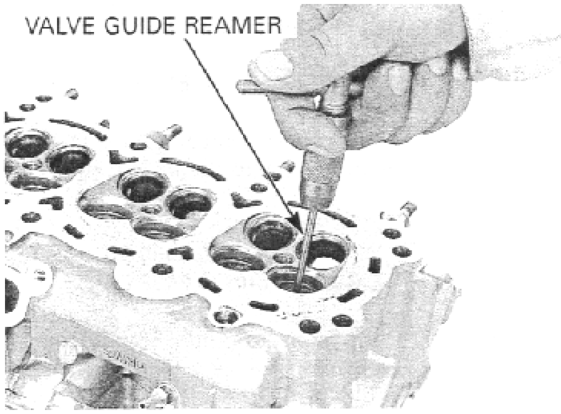
SPECIFIED DEPTH:
IN: 16.1 – 16.4 mm (0.63 – 0.65 in)
EX: 14.3 – 14.6 mm (0.56 – 0.57 in)

TOOL:
Valve guide driver **07JMD–KY20100**

Let the cylinder head cool to room temperature.

Use cutting oil on the reamer during this operation.

Ream the new valve guide after installation.
Insert the reamer from the combustion chamber side of the head and also always rotate the reamer clockwise.

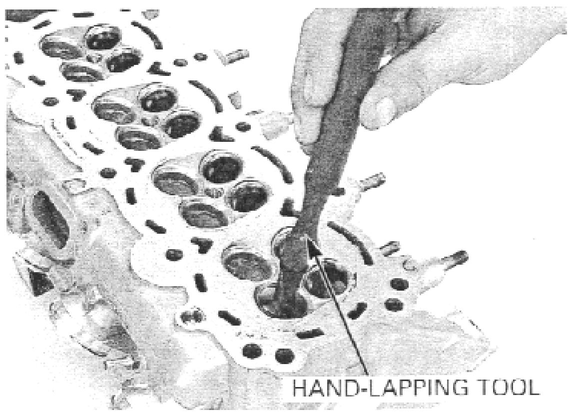


TOOL:
Valve guide reamer, 4.008 mm 07MMH–MV90100

Clean the cylinder head thoroughly to remove any metal particles.
Reface the valve seat (see the following procedure).

VALVE SEAT INSPECTION/REFACING

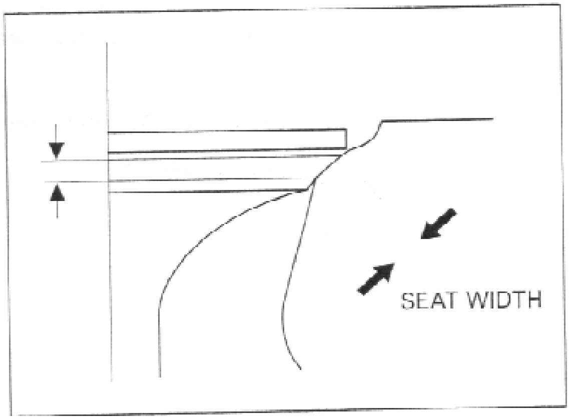
Clean the intake and exhaust valves thoroughly to remove any carbon deposits.
Apply a light coat of Prussian Blue to the valve seats.
Tap the valves and seats using a rubber hose or another hand-lapping tool.



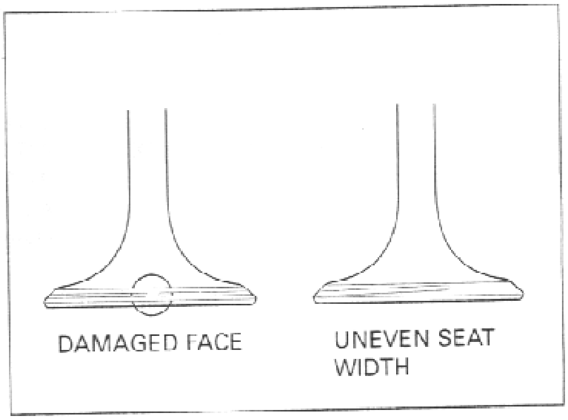
Remove the valve and inspect the valve seat face. The valve seat contact should be within the specified width and even all around the circumference.

STANDARD: 0.90 – 1.10 mm (0.035 – 0.043 in)
SERVICE LIMIT: 1.5 mm (0.06 in)

If the seat width is not within specification, reface the valve seat (page 8-18).

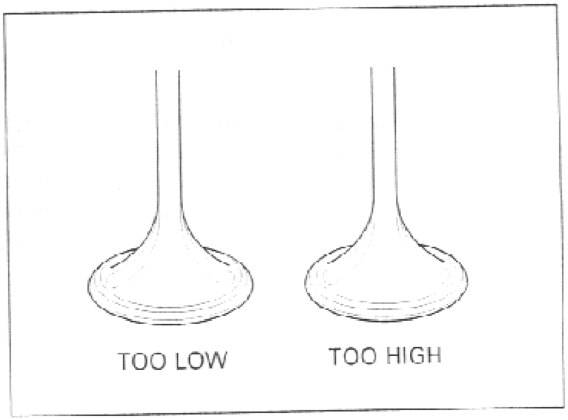


Inspect the valve seat face for:
- Uneven seat width:
  - Replace the valve and reface the valve seat.
- Damaged face:
  - Replace the valve and reface the valve seat.



The valves cannot be ground. If a valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.

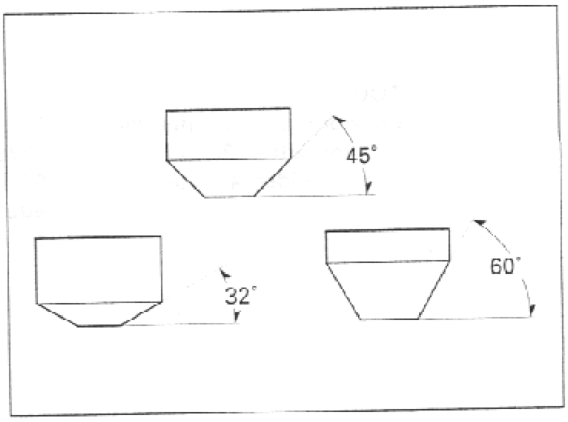
- Contact area (too low or too high)
  - Reface the valve seat.



VALVE SEAT REFACING

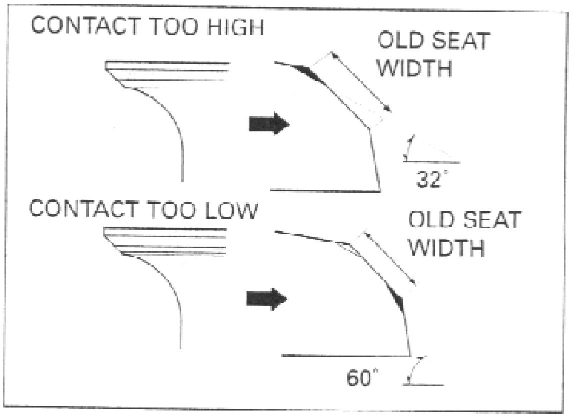
Follow the refacing manufacturer's operating instructions.

Valve seat cutters/grinders or equivalent valve seat refacing equipment are recommended to correct worn valve seats.



If the contact area is too high on the valve, the seat must be lowered using a 32° flat cutter.

If the contact area is too low on the valve, the seat must be raised using a 60° interior cutter.

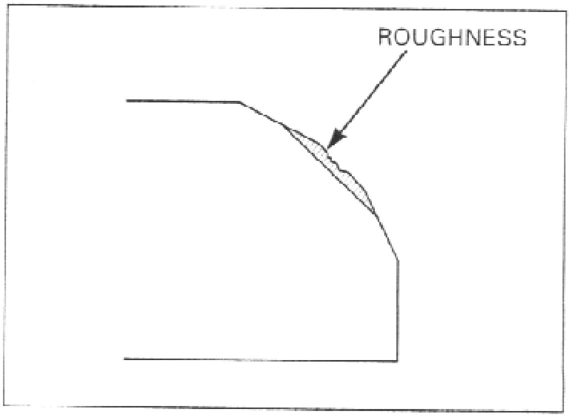


Reface the seat with a 45-degree cutter whenever a valve guide is replaced.

Use a 45-degree cutter to remove any roughness or irregularities from the seat.

TOOLS:

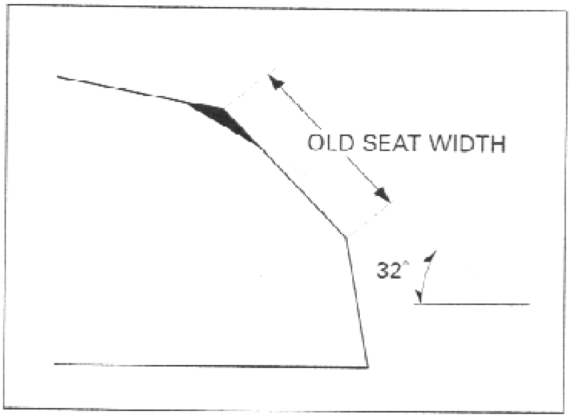
Seat cutter, 27.5 mm (IN)	**07780–0010200**
Seat cutter, 24.5 mm (EX)	**07780–0010100**
Cutter holder, 4.0 mm	**07781–0010500 or equivalent commercially available**



Use a 32-degree cutter to remove the top 1/4 of the existing valve seat material.

TOOLS:

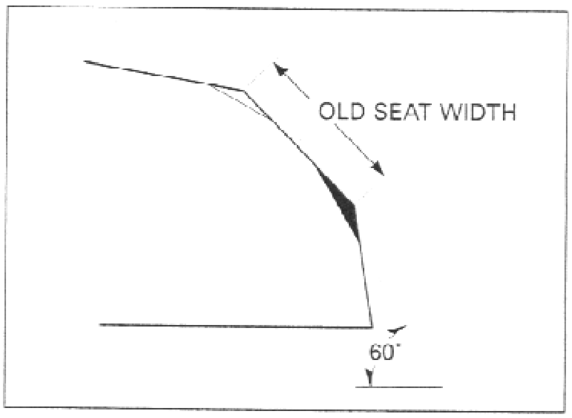
Flat cutter, 27 mm (IN)	**07780–0013300**
Flat cutter, 24 mm (EX)	**07780–0012500**
Cutter holder, 4.0 mm	**07781–0010500 or equivalent commercially available**



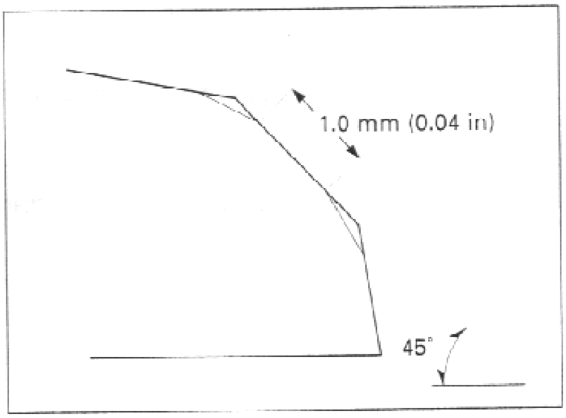
Use a 60-degree cutter to remove the bottom 1/4 of the old seat.

TOOLS:

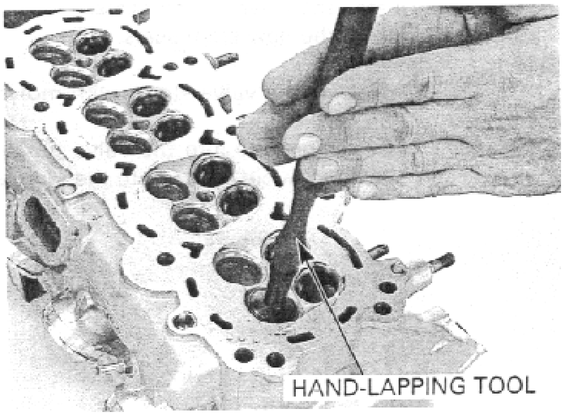
Interior cutter, 26 mm (IN)	**07780–0014500**
Interior cutter, 22 mm (EX)	**07780–0014202**
Cutter holder, 4.0 mm	**07781–0010500 or equivalent commercially available**



Using a 45° seat cutter, cut the seat to the proper width.
Make sure that all pitting and irregularities are removed.
Refinish if necessary.



After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

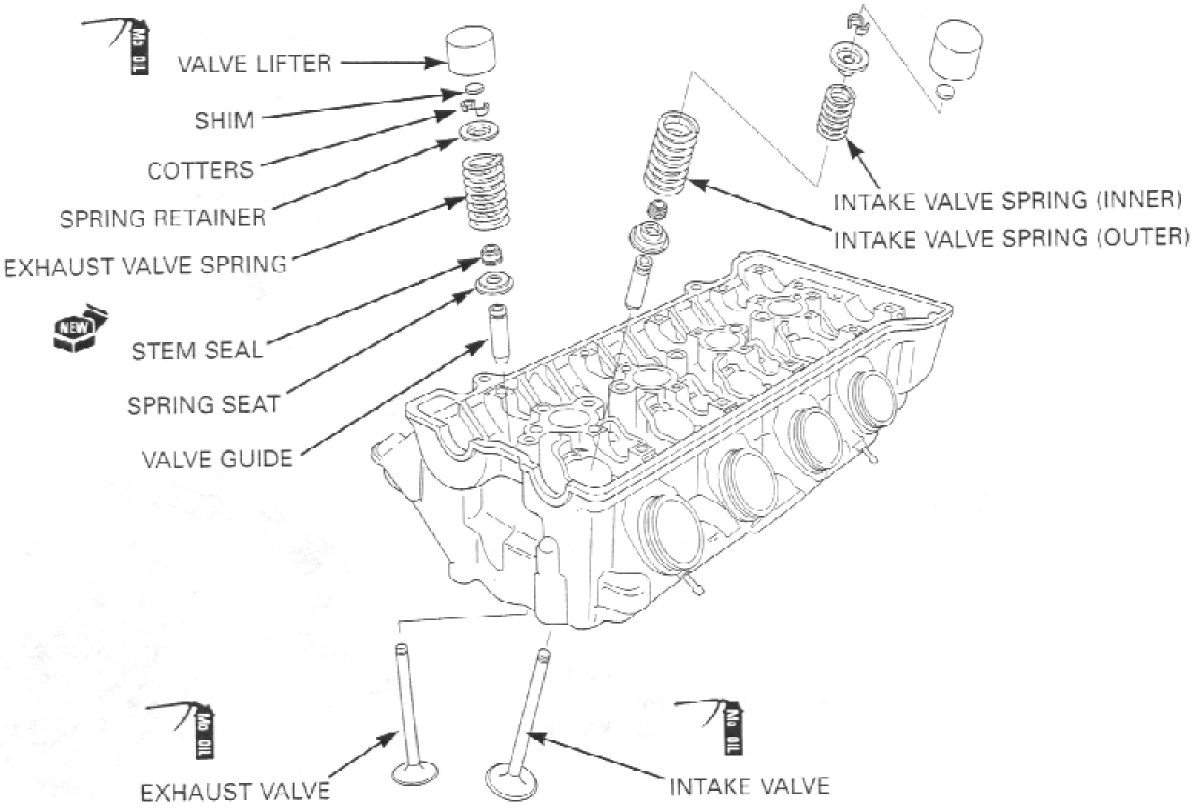


NOTICE

- *Excessive lapping pressure may deform or damage the seat.*
- *Change the angle of the lapping tool frequently to prevent uneven seat wear.*
- *Do not allow any lapping compound to enter the guides.*

After lapping, wash all residual compound off the cylinder head and valve.

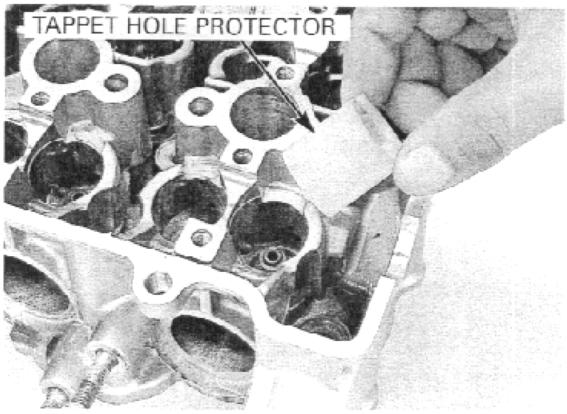
CYLINDER HEAD ASSEMBLY



Blow out all oil passages in the cylinder head with compressed air.

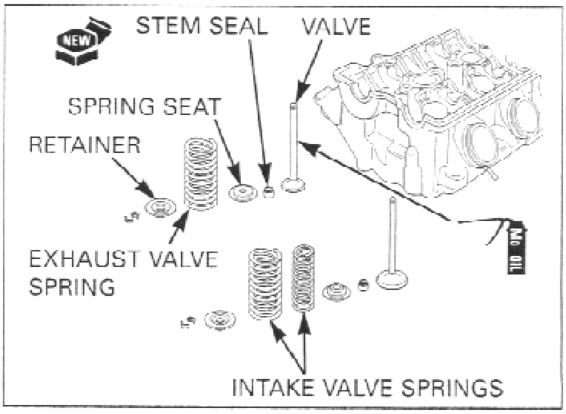
Install the tappet hole protector into the valve lifter bore.

TOOL:
Tappet hole protector 07HMG-MR70002

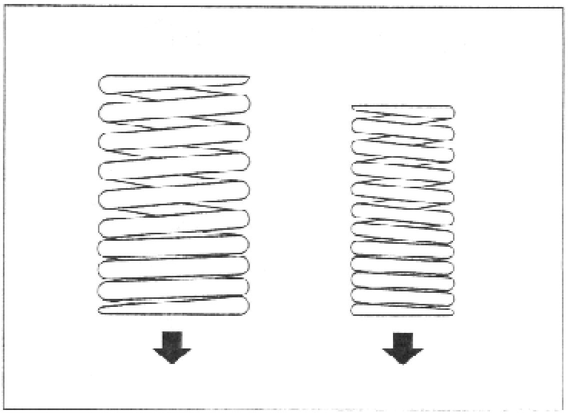


Install the valve spring seats.
Install the new stem seals.

Lubricate the valve stems with molybdenum oil solution.
Insert the valve into the valve guide while turning it slowly to avoid damage to the stem seal.



Install the valve spring with the tightly wound coils facing the combustion chamber.
Install the valve spring retainer.



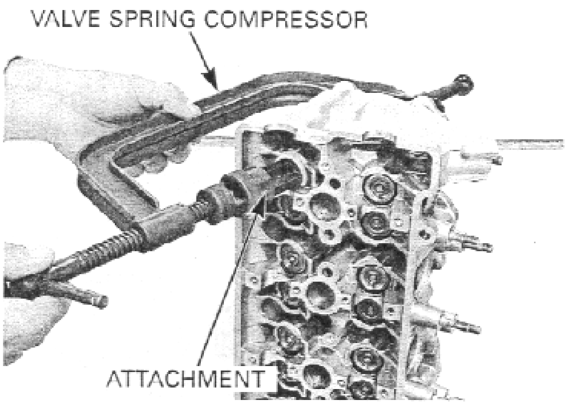
Grease the cotters to ease installation.

Install the valve cotters using the special tool as shown.

NOTICE

To prevent loss of tension, do not compress the valve spring more than necessary.

TOOLS:
Valve spring compressor 07757-0010000
Valve spring compressor attachment 07959-KM30101

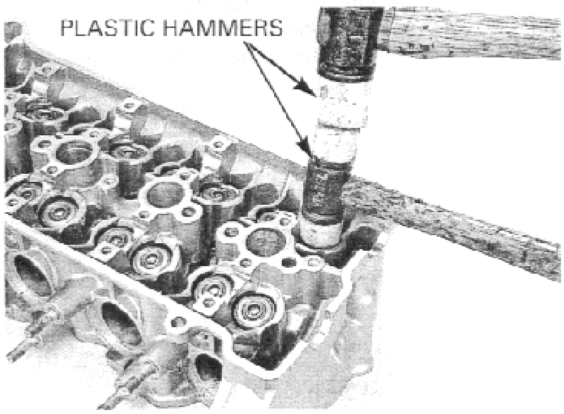


Support the cylinder head above the work bench surface to prevent possible valve damage.

Tap the valve stems gently with two plastic hammers as shown to seat the cotters firmly.

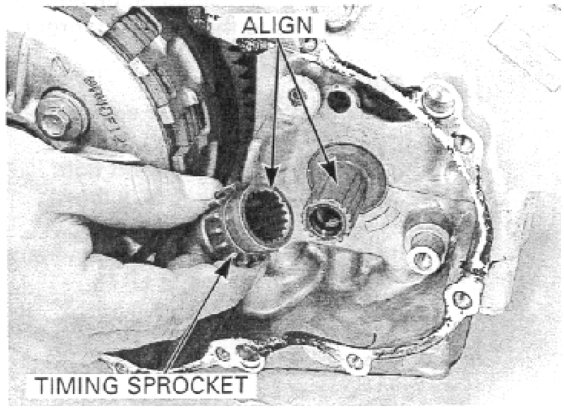
Install and tighten the spark plugs.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

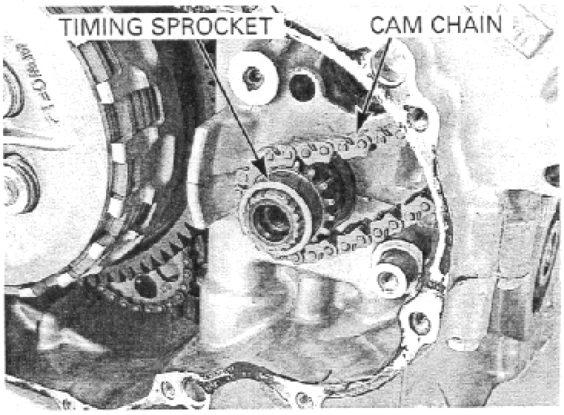


CYLINDER HEAD INSTALLATION

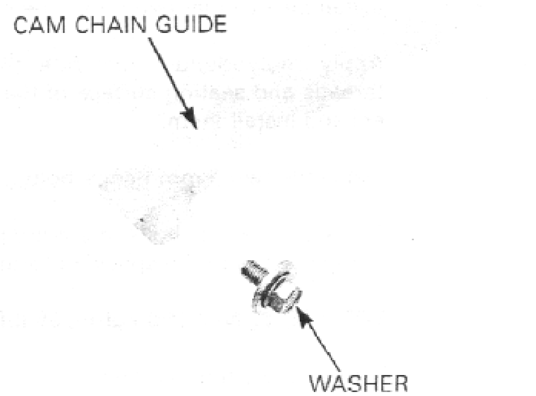
Install the timing sprocket by aligning the wide teeth between the crankshaft and sprocket.



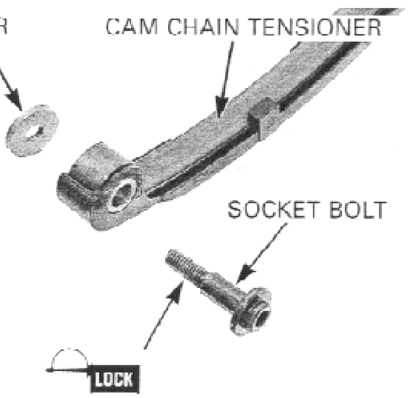
Install the cam chain.



Install the cam chain guide and bolt/washer.



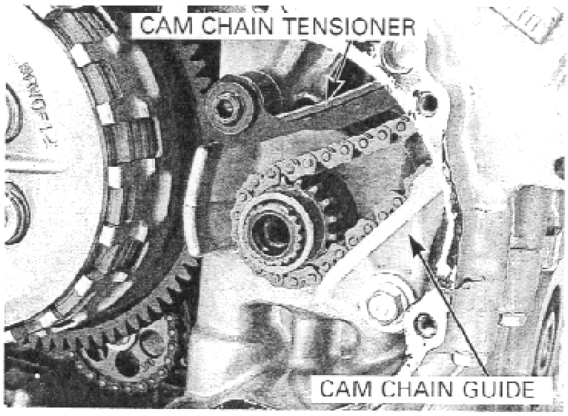
Apply a locking agent to the cam chain tensioner socket bolt threads.
Install the washer, cam chain tensioner and socket bolt.



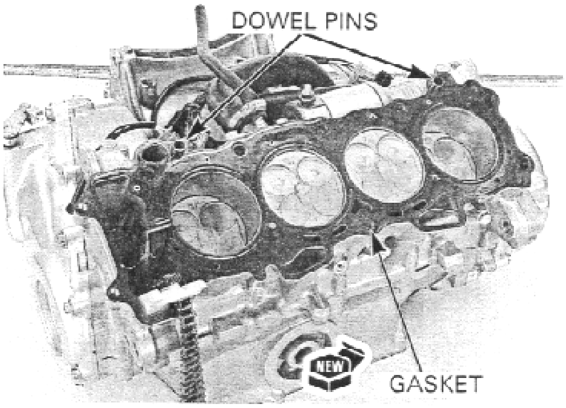
Tighten the cam chain guide and cam chain tensioner socket bolts to the specified torque.

TORQUE:
Cam chain tensioner socket bolt:
10 N•m (1.0 kgf•m, 7 lbf•ft)
Cam chain guide socket bolt:
12 N•m (1.2 kgf•m, 9 lbf•ft)

Install the ignition pulse generator rotor and right crankcase cover (page 17-7).



Install the dowel pins and a new cylinder head gasket as shown.



Install the cylinder head onto the cylinder block.

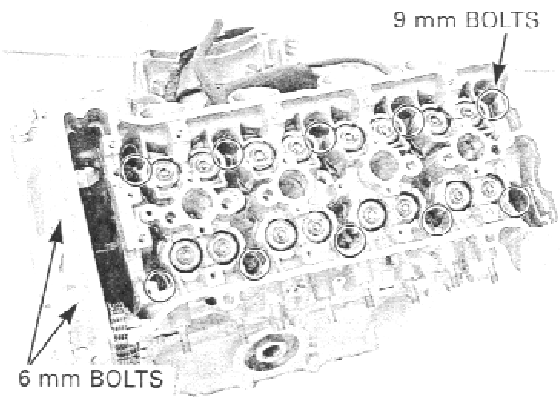
Apply molybdenum disulfide oil solution to the threads and seating surface of the 9-mm bolts/washers and install them.

Install the two 6-mm flange bolts.

Tighten the 9-mm bolts in a crisscross pattern in two to three steps to the specified torque.

TORQUE: 47 N•m (4.8 kgf•m, 35 lbf•ft)

Tighten the 6 mm flange bolts.

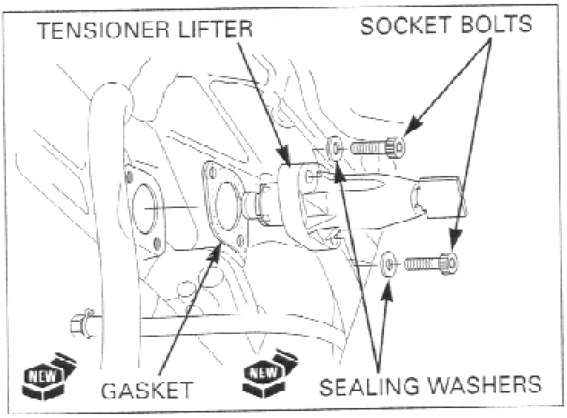


Install the cam chain tensioner lifter onto the cylinder head with a new gasket.

Install new sealing washers and tighten the mounting bolts to the specified torque.

TORQUE: 10 N•m (1.0 kgf•m, 7 lbf•ft)

Remove the following:
- Thermostat housing (page 6-7)
- Camshaft (see below)

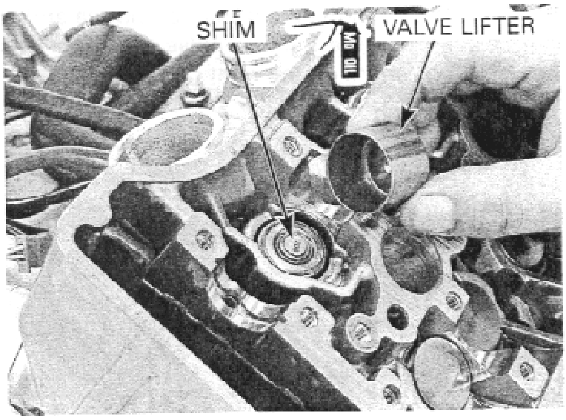


CAMSHAFT INSTALLATION

Apply molybdenum oil solution to the outer surface of each valve lifter.

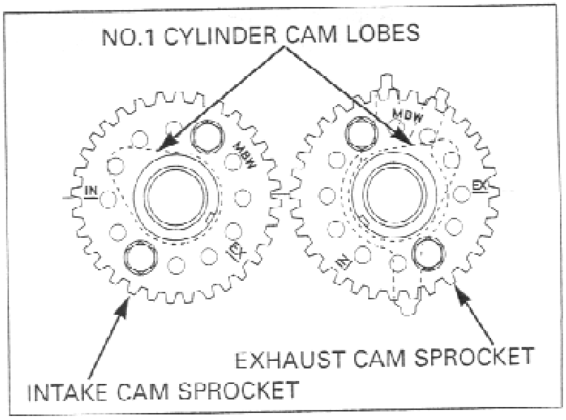
Install the shims and valve lifters in their original locations.

Install the shims and valve lifters into the valve lifter bores.

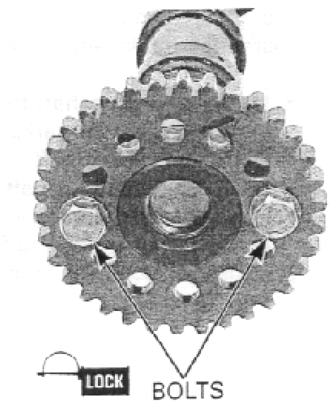


If the cam sprockets are removed, install the cam sprockets onto the camshafts.

- Install the intake cam sprocket with the timing mark (IN) facing outward and the No.1 cam lobes facing up and out as shown.
- Install the exhaust cam sprocket with the timing mark (EX) facing outward and the No.1 cam lobes facing up and out as shown.

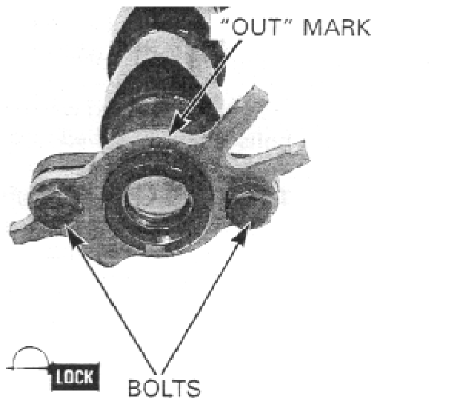


Clean the cam sprocket bolt and apply a locking agent to the threads.
Install the cam sprocket bolts.

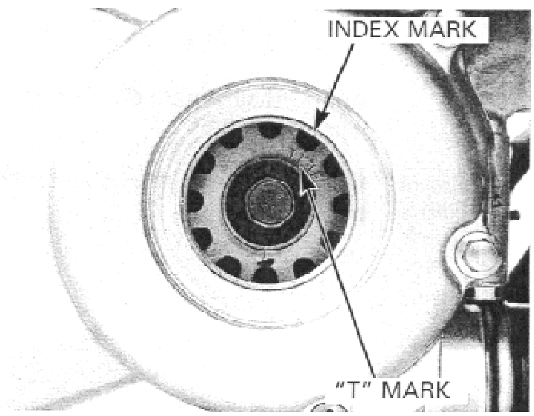


Install the cam pulse generator rotor with the No.1 camshaft lobes facing up and the rotor "OUT" mark facing down as shown.

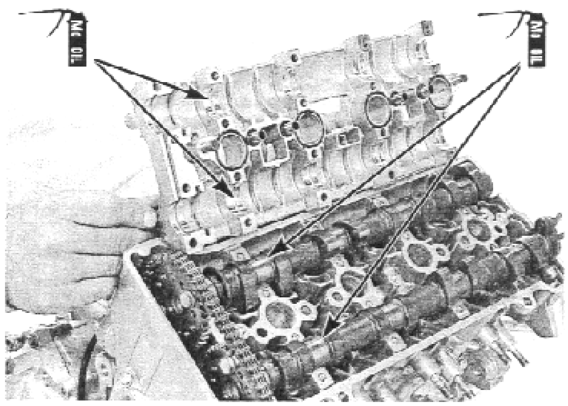
Clean and apply a locking agent to the cam cam pulse generator rotor threads.
Install the cam pulse generator rotor and mounting bolts.



Turn the crankshaft clockwise and align the "T" mark on the ignition pulse generator rotor with the index mark on the right crankcase cover.

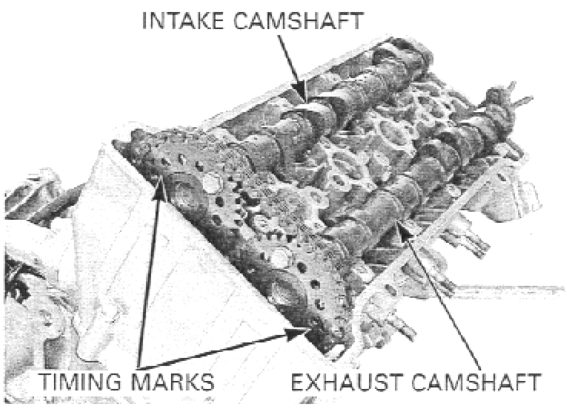


Apply molybdenum oil solution to the camshaft journals of the cylinder head and camshaft holder.



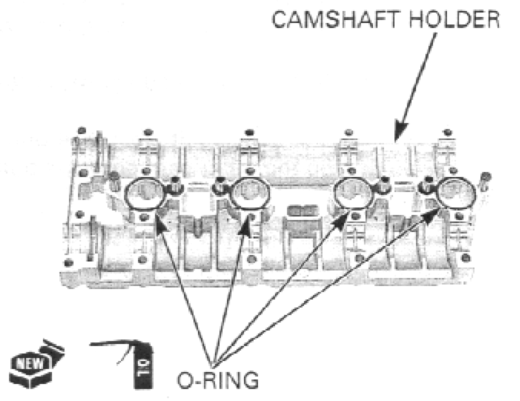
Install the cam chain over the cam sprockets and then install the intake and exhaust camshafts.

- Install each camshaft to the correct locations. Note the identification marks.
  "IN": Intake camshaft
  "EX": Exhaust camshaft
- Make sure the timing marks on the cam sprockets are facing outward and flush with the cylinder head upper surface as shown.



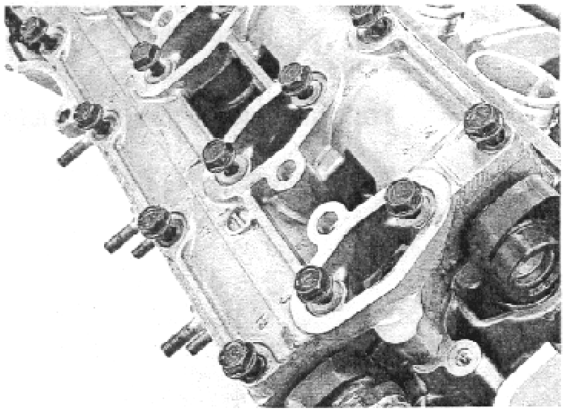
Coat new O-rings with oil and install them into the grooves in the camshaft holder.

Install the camshaft holder onto the camshafts.



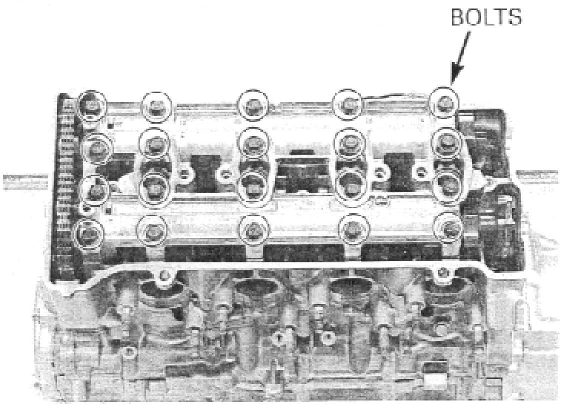
Make sure the dowel pins in the camshaft holder align properly with the holes in the cylinder head.

Apply engine oil to the threads and seating surfaces of the camshaft holder bolts.
Install the 20 holder bolts with eight new washers as shown.
Finger tighten the bolts.



The camshaft holder have the numbers "1 through 20mark on them.
Gradually tighten the #6, #5, #8, and #7 bolts (in that order) 1/4 to 1/2 of a turn at a time to draw the holder down evenly until the clearance between the cylinder head and the holder is 2 – 3 mm all the way around.

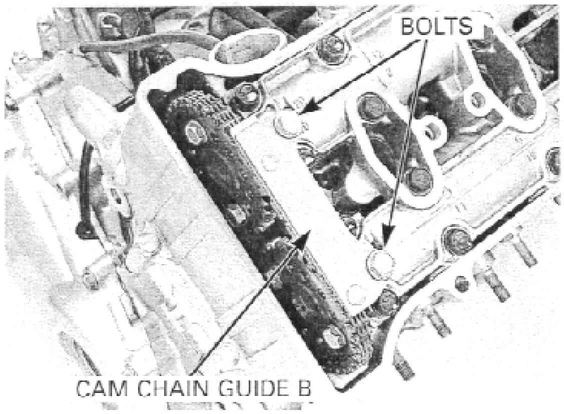
If the holder tilts toward the #1 cylinder during this process, readjust bolts #6, #5, #8, and #7 as necessary to keep the holder level.
When the holder is parallel with the cylinder head, resume tightening the bolts in the sequence specified above.



Once the clearance is within 2 – 3 mm, begin tightening all the bolts in the proper numerical order (#1, #2, #3....#20) 1/4 turn at a time until the holder is fully seated against the cylinder head.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

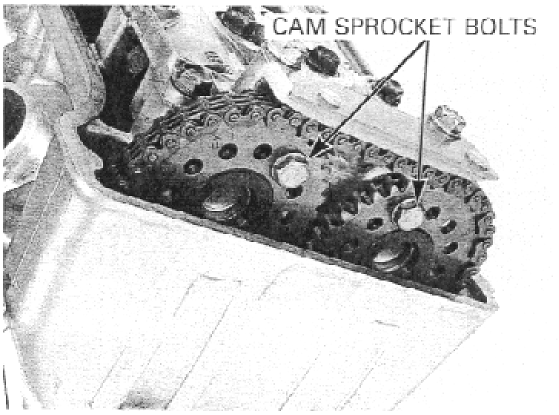
Install cam chain guide B and tighten the bolts.



In case the cam sprockets were removed, tighten the cam sprocket bolts to the specified torque.

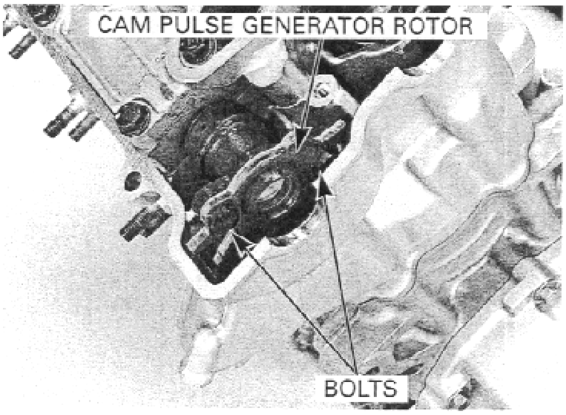
TORQUE: 20 N•m (2.0 kgf•m, 14 lbf•ft)

Turn the crankshaft clockwise one full turn (360°) and tighten the other cam sprocket bolts.

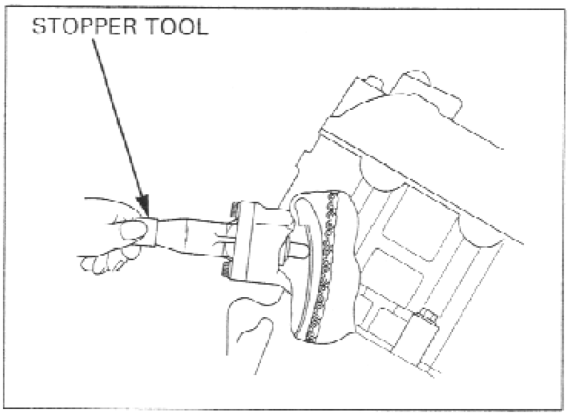


In case the cam pulse generator rotor bolts were removed, tighten the rotor bolts to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

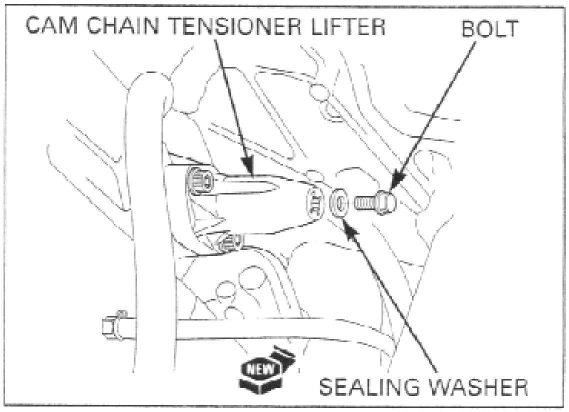


Remove the stopper tool from the cam chain tensioner lifter.

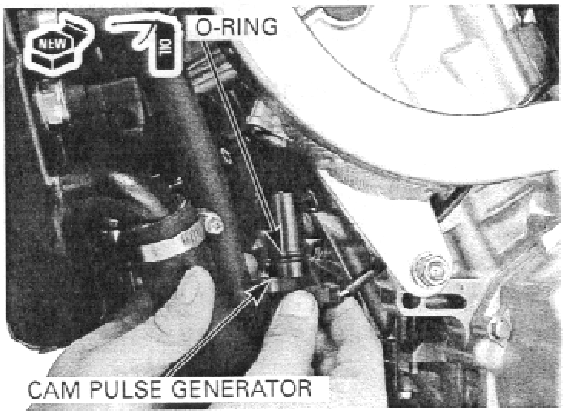


Install a new sealing washer and tighten the sealing bolt.

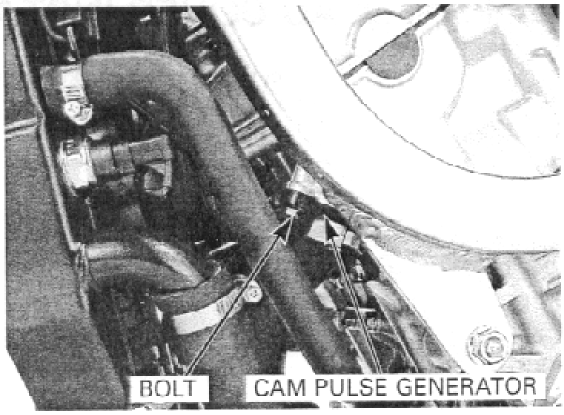
Recheck the valve timing.



Apply oil to the new O-ring and install it onto the cam pulse generator.
Install the cam pulse generator into the cylinder head.

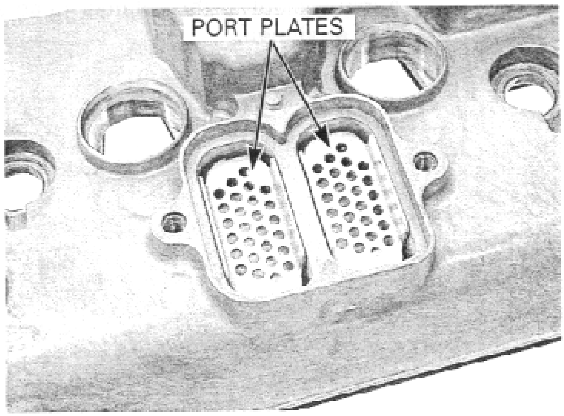


Install and tighten the mounting bolt securely.

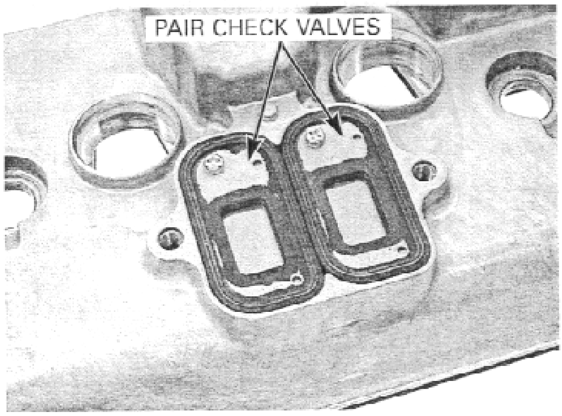


CYLINDER HEAD COVER ASSEMBLY

Install the PAIR check valve port plates into the cylinder head cover.

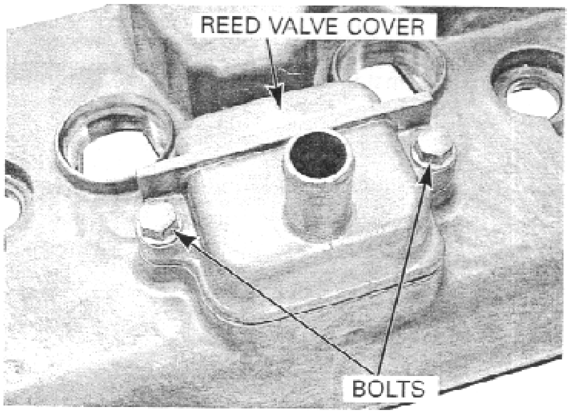


Install the PAIR check valves into the cylinder head cover.



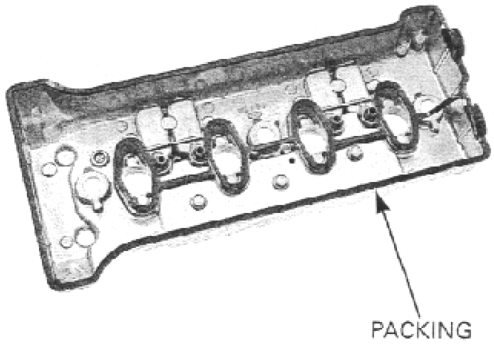
Install the PAIR reed valve covers and tighten the SH bolts to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

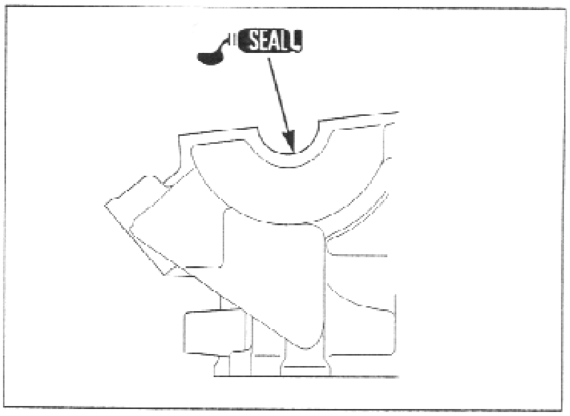


CYLINDER HEAD COVER INSTALLATION

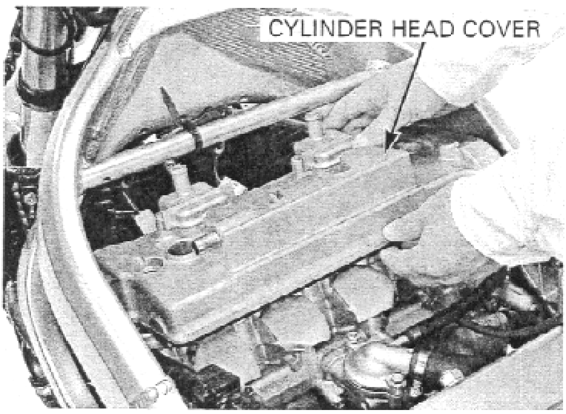
Install the cylinder head packing into the groove of the cylinder head cover.



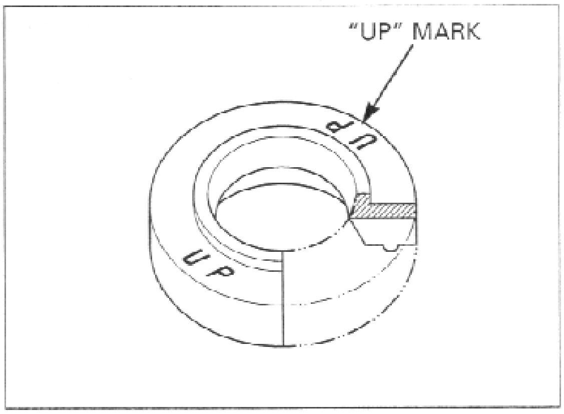
Apply sealant to the cylinder head semi-circular cut-outs as shown.



Install the cylinder head cover onto the cylinder head.

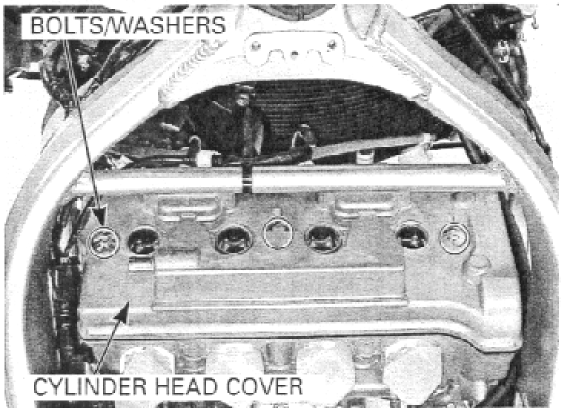


Install the washers with their "UP" mark facing up.



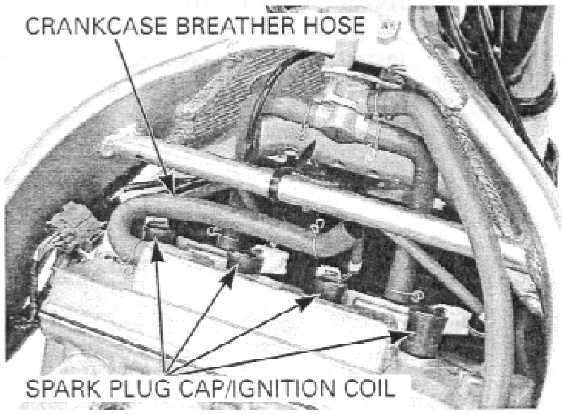
Install and tighten the cylinder head cover special bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)



Install the direct ignition coils and connect the ignition coil connector.
Connect the air suction hoses to the PAIR reed valve covers.

Install the crankcase breather hose.

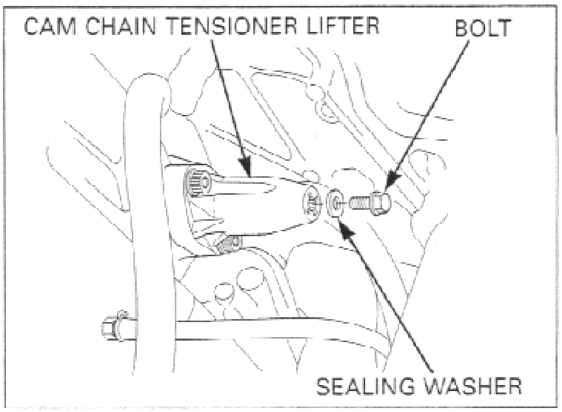


CAM CHAIN TENSIONER LIFTER

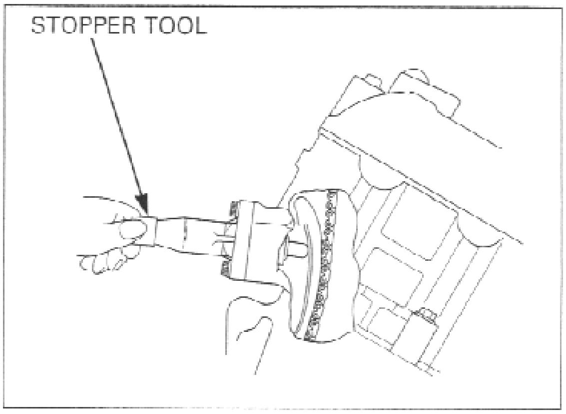
REMOVAL

Remove the throttle body (page 5-62).

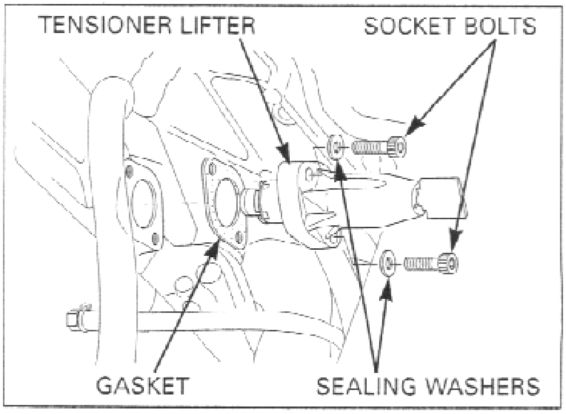
Remove the cam chain tensioner sealing bolt and sealing washer.



Turn the tensioner shaft fully in (clockwise) and secure it using the stopper tool to prevent damaging the cam chain.
See page 8-7 for detail of the tool.



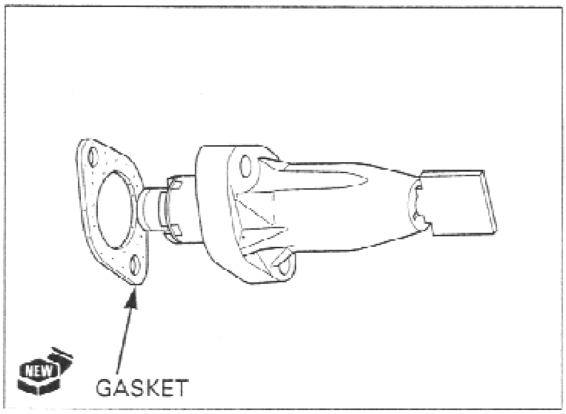
Remove the bolts and cam chain tensioner lifter.
Remove the gasket.



INSTALLATION

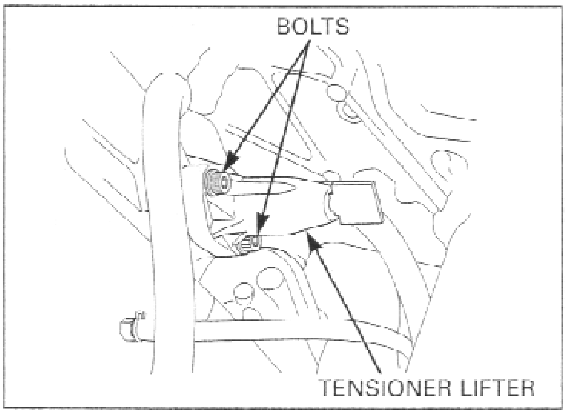
Note the installation direction of the gasket.

Install the new gasket onto the cam chain tensioner lifter.

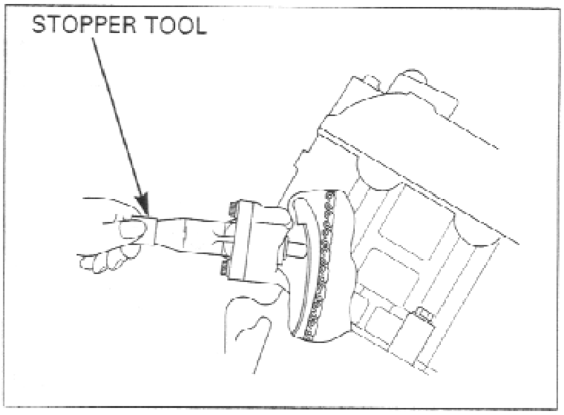


Install the cam chain tensioner lifter into the cylinder head.
Install and tighten the mounting bolts to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

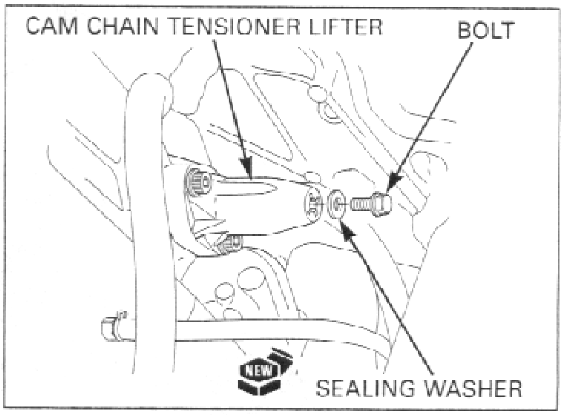


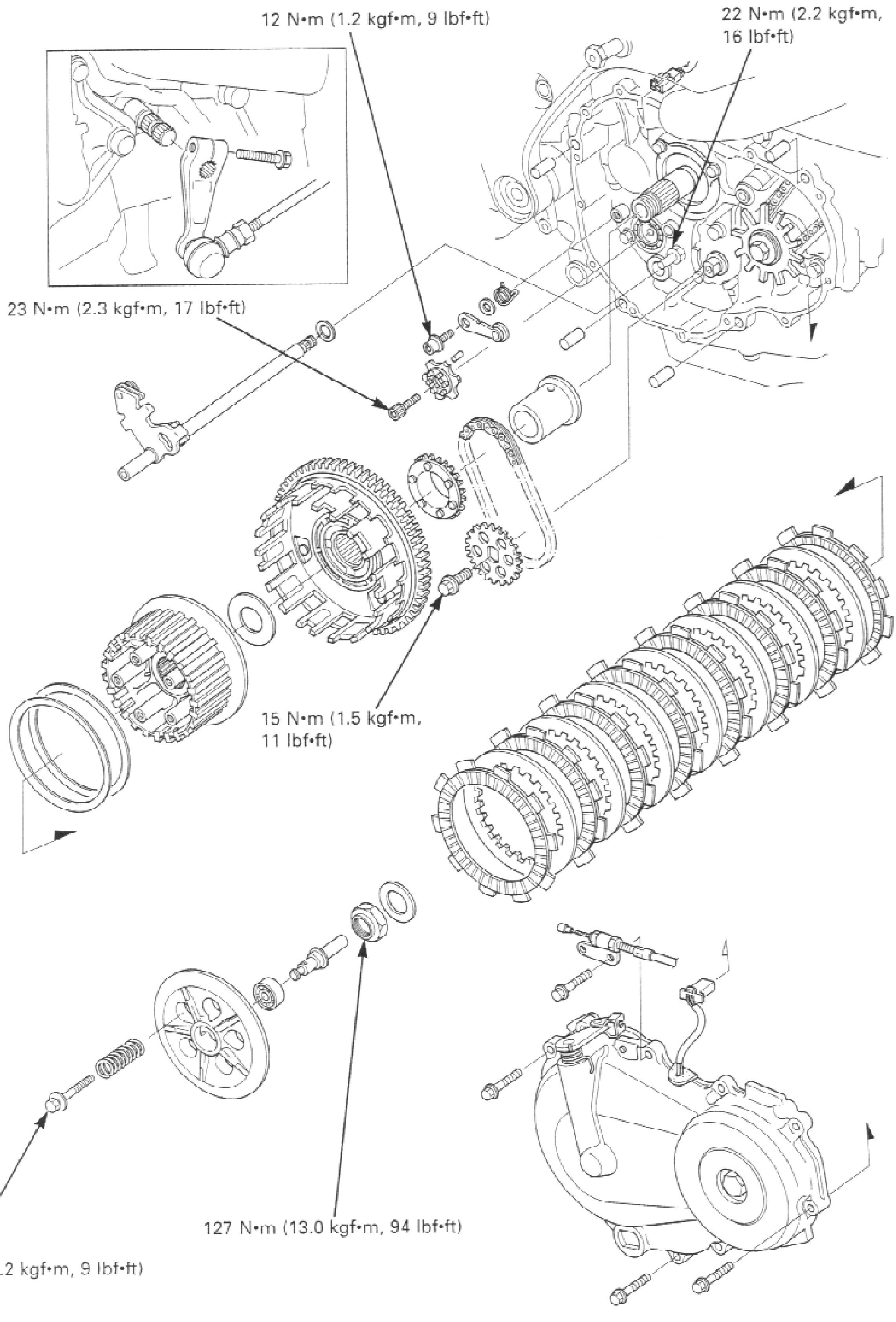
Remove the stopper tool.



Install a new sealing washer and tighten the sealing bolt securely.

Install the removed parts in the reverse order of removal.




12 N•m (1.2 kgf•m, 9 lbf•ft)
22 N•m (2.2 kgf•m, 16 lbf•ft)
23 N•m (2.3 kgf•m, 17 lbf•ft)
15 N•m (1.5 kgf•m, 11 lbf•ft)
127 N•m (13.0 kgf•m, 94 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)

9. CLUTCH/GEARSHIFT LINKAGE

SERVICE INFORMATION

GENERAL

- This section covers service of the clutch, gearshift linkage, shift drum and shift forks. All service can be done with the engine installed in the frame.
- Transmission oil viscosity and level have an effect on clutch disengagement. When the clutch does not disengage or the motorcycle creeps with clutch disengaged, inspect the transmission oil level before servicing the clutch system.

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Clutch lever free play		10 – 20 (3/8 – 13/16)	—
Clutch	Spring free length	44.7 (1.76)	43.4 (1.71)
	Disc thickness	2.92 – 3.08 (0.115 – 0.121)	2.6 (0.10)
	Plate warpage	—	0.30 (0.012)
Clutch outer guide	I.D.	25.000 – 25.021 (0.9843 – 0.9851)	25.03 (0.985)
	O.D.	34.975 – 34.991 (1.3770 – 1.3776)	34.97 (1.377)
Mainshaft O.D. at clutch outer guide		24.980 – 24.993 (0.9835 – 0.9840)	24.96 (0.983)

TORQUE VALUES

Clutch center lock nut	127 N•m (13.0 kgf•m, 94 lbf•ft)	Apply oil to the threads. Stake the nut.
Clutch spring bolt/washer	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Oil pump driven sprocket bolt	15 N•m (1.5 kgf•m, 11 lbf•ft)	Apply a locking agent to the threads.
Shift drum center socket bolt	23 N•m (2.3 kgf•m, 17 lbf•ft)	Apply a locking agent to the threads.
Shift drum stopper arm pivot bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Gearshift spindle return spring pin	22 N•m (2.2 kgf•m, 16 lbf•ft)	
Ignition pulse generator wire guide bolt/washer	12 N•m (1.2 kgf•m, 9 lbf•ft)	

TOOLS

Clutch center holder	07724–0050002	Equivalent commercially available in U.S.A.
Driver	07749–0010000	
Attachment, 32 x 35 mm	07746–0010100	
Attachment, 37 x 40 mm	07746–0010200	
Pilot, 17 mm	07746–0040400	
Pilot, 35 mm	07746–0040800	

9

TROUBLESHOOTING

Clutch lever too hard to pull in
- Damaged clutch lifter mechanism
- Faulty clutch lifter bearing
- Clutch lifter piece installed improperly

Clutch slips when accelerating
- Worn clutch disc
- Weak clutch springs
- Transmission oil mixed with molybdenum or graphite additive

Clutch will not disengage or motorcycle creeps with clutch disengaged
- Clutch plate warped
- Loose clutch lock nut
- Oil level too high
- Improper oil viscosity
- Damaged clutch lifter mechanism
- Clutch lifter piece installed improperly

Hard to shift
- Improper clutch operation
- Improper oil viscosity
- Bent shift fork
- Bent shift fork shaft
- Bent fork claw
- Damaged shift drum cam groove
- Loose stopper plate bolt
- Damaged stopper plate and pin
- Damaged gearshift spindle

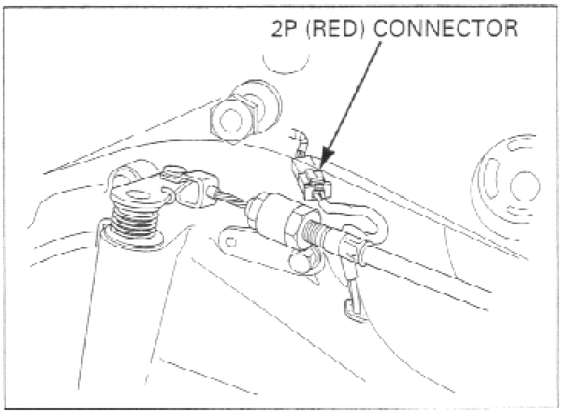
Transmission jumps out of gear
- Worn shift drum stopper arm
- Weak or broken shift arm return spring
- Loose stopper plate bolt
- Bent shift fork shaft
- Damaged shift drum cam groove
- Damaged or bent shift forks
- Worn gear engagement dogs or slots

Gearshift pedal will not return
- Weak or broken gearshift spindle return spring
- Bent gearshift spindle

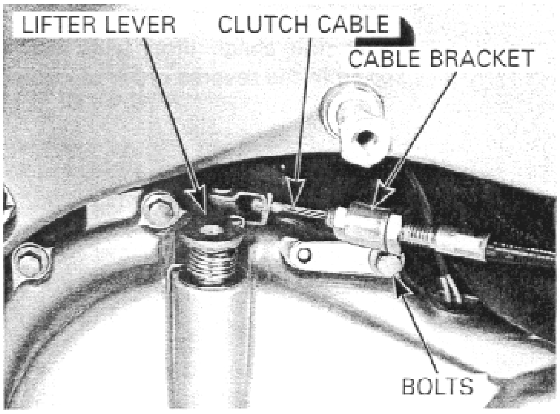
RIGHT CRANKCASE COVER REMOVAL

Drain the engine oil (page 3-15).
Remove the lower cowl (page 2-4).

Disconnect the ignition pulse generator 2P (Red) connector.

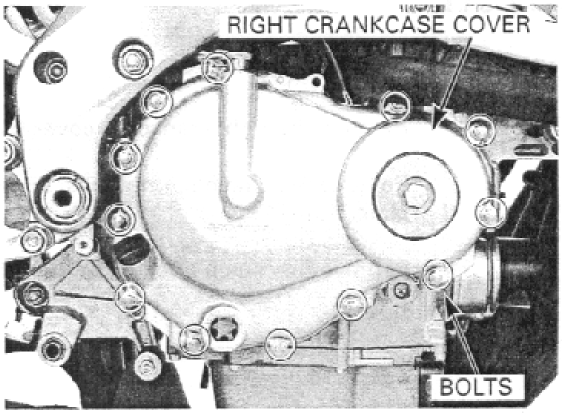


Remove the bolts and clutch cable guide, then disconnect the clutch cable end from the clutch lifter lever.



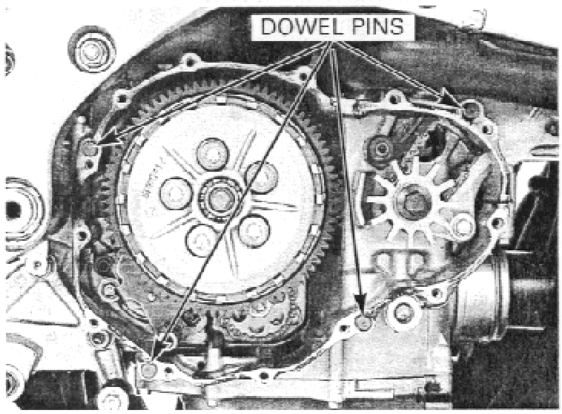
The lifter arm spindle is engaged with the clutch lifter piece inside the right crankcase cover.

Remove the right crankcase cover SH bolts.
Remove the right crankcase cover while turning the clutch lifter arm counterclockwise to disengage the lifter arm spindle from the lifter piece.



Remove the two dowel pins.

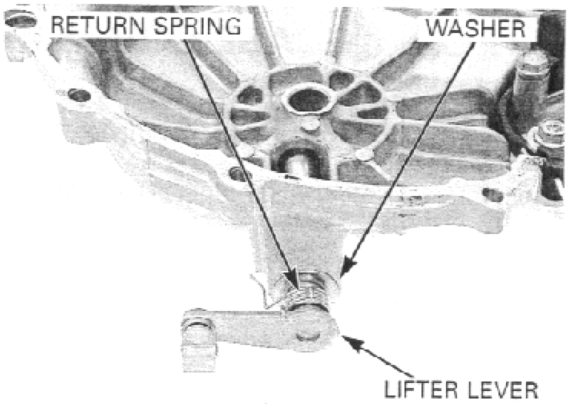
Clean off any sealant from the right crankcase cover mating surfaces.



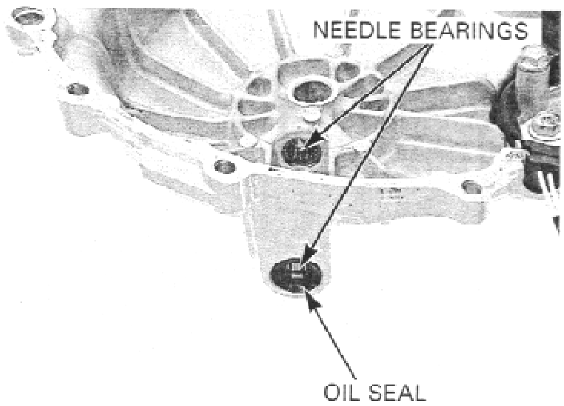
CLUTCH LIFTER LEVER

Remove the clutch lifter lever, return spring and washer from the right crankcase cover.

Check the lifter lever spindle for wear or damage.
Check the return spring for fatigue or damage.



Check the lifter lever oil seal and needle bearings for wear or damage.
Install the clutch lifter lever with the washer and spring in the reverse order of removal.



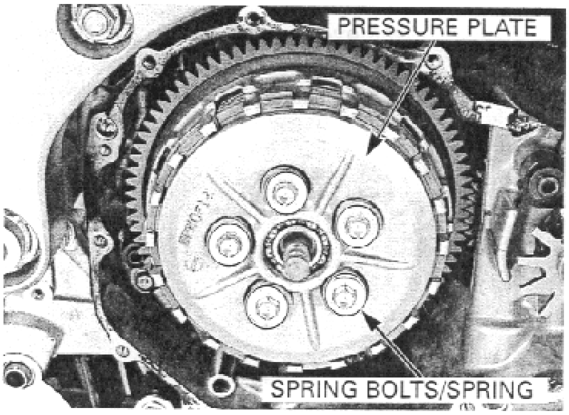
CLUTCH

REMOVAL

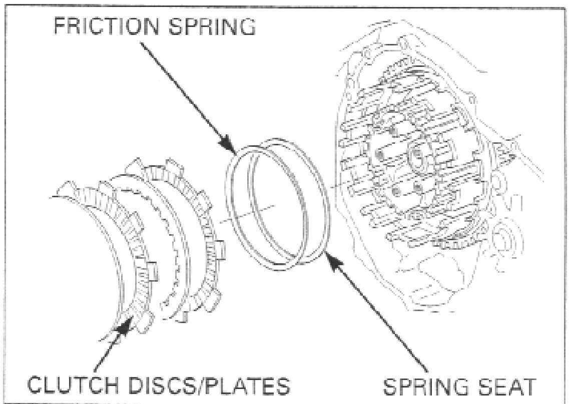
Remove the right crankcase cover (page 9-3).

Remove the clutch spring bolts, springs and pressure plate.

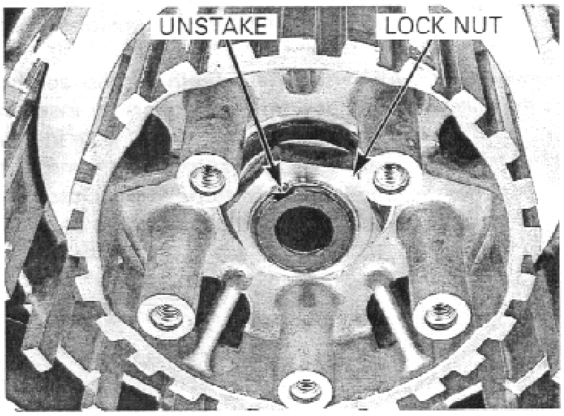
Remove the clutch lifter piece from the lifter bearing.



Remove the following:
- Eight clutch discs
- Seven clutch plates
- Spring seat
- Friction spring



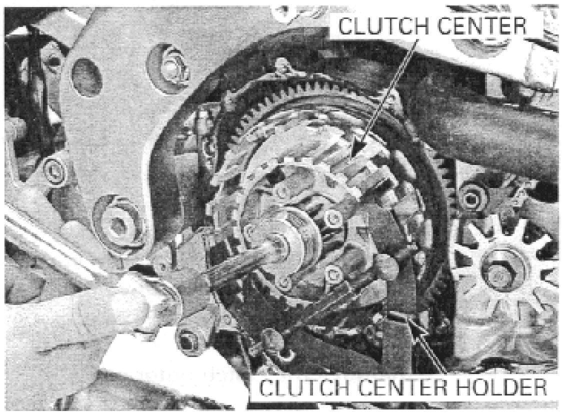
Unstake the clutch center lock nut.



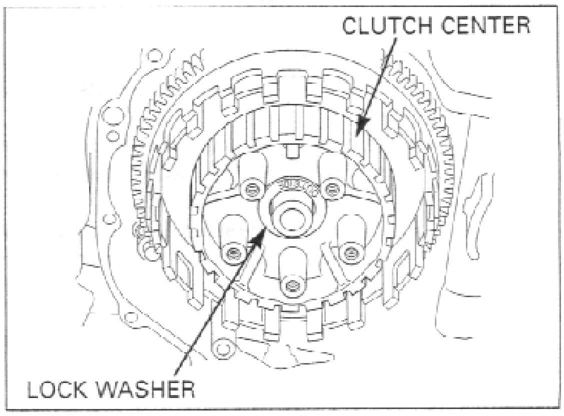
Hold the clutch center with the clutch center holder, then remove the lock nut.

TOOL:
Clutch center holder **07724–0050002 (equivalent commercially available in U.S.A.)**

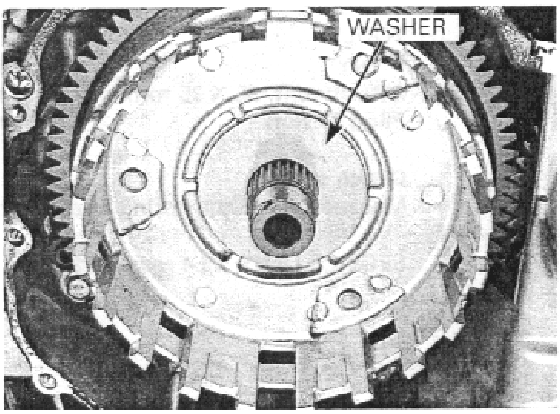
Discard the lock nut.



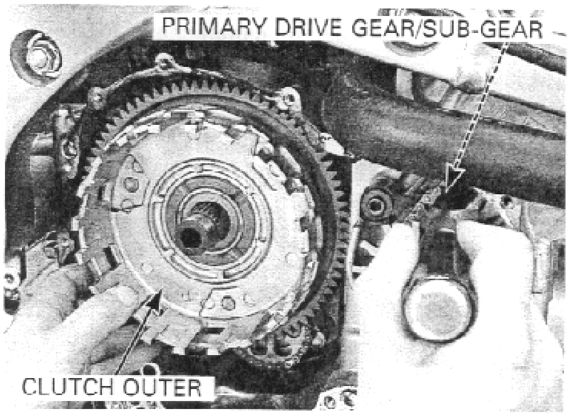
Remove the lock washer and clutch center.



Remove the washer.

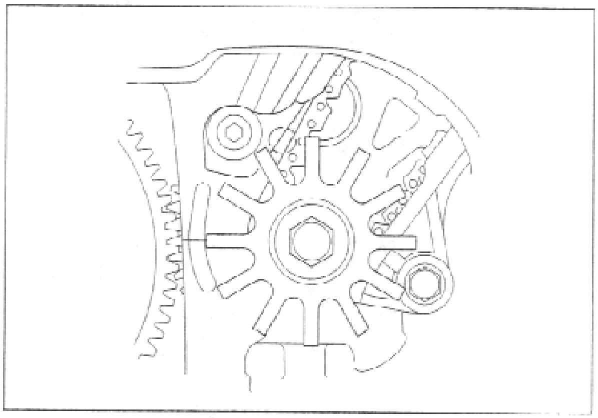


Remove the throttle body (page 5-62).
Loosen the cam chain tensioner (page 8-29).



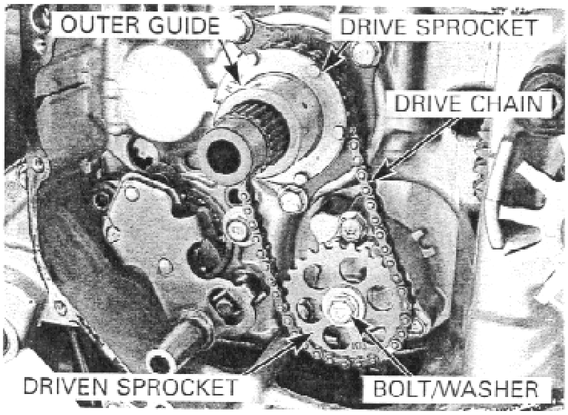
Be careful not to bend the ignition pulse generator rotor tangs.

Align the gear teeth of the scissor gears (primary drive gear and sub-gear) by inserting a 5-mm pin or screwdriver into the gear hole indicated by the punch mark on the sub-gear through the hole in the crankcase, and remove the clutch outer.
Gear hole position is shown below.



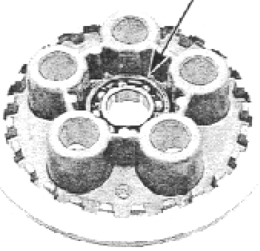
Remove the oil pump driven sprocket bolt/washer.
Remove the oil pump drive/driven sprocket and drive chain as an assembly.

Remove the clutch outer guide.



INSPECTION

Clutch lifter bearing
Turn the inner race of the lifter bearing with your finger.
The bearing should turn smoothly and quietly.
Also check that the outer race of the bearing fits tightly in the pressure plate.
Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fit loosely in the pressure plate.



Drive the bearing out of the pressure plate.

Drive a new bearing into the pressure plate with the marked side facing out.

TOOLS:

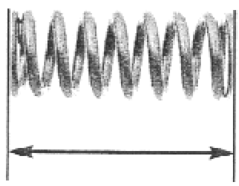
Driver	**07749–0010000**
Attachment, 32 X 35 mm	**07746–0010100**
Pilot, 17 mm	**07746–0040400**

Clutch spring

Replace the clutch spring as a set.

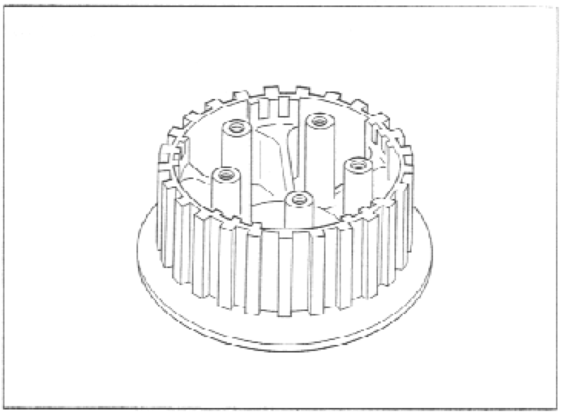
Measure the clutch spring free length.

SERVICE LIMIT: 43.4 mm (1.78 in)



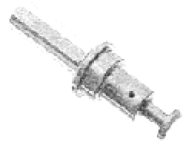
Clutch center

Check the grooves of the clutch center for damage or wear caused by the clutch plates.
Replace if necessary.



Clutch lifter piece

Check the clutch lifter piece for damage or abnormal wear.



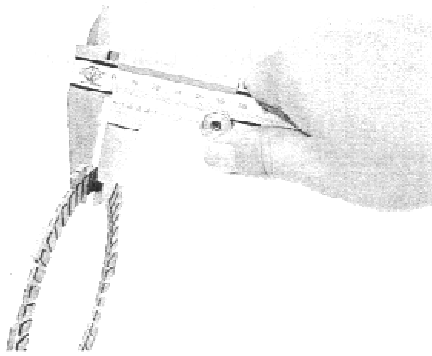
Clutch disc

Replace the clutch discs and plates as a set.

Replace the clutch discs if they show signs of scoring or discoloration.

Measure the disc thickness of each disc.

SERVICE LIMIT: 2.6 mm (0.10 in)

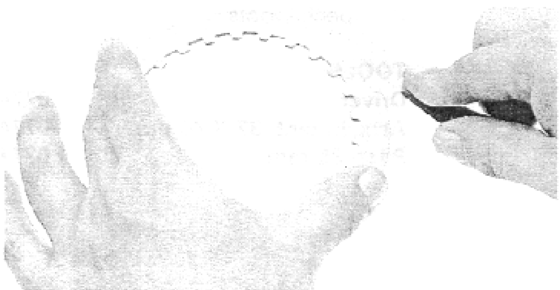


Clutch plate

Replace the clutch discs and plates as a set.

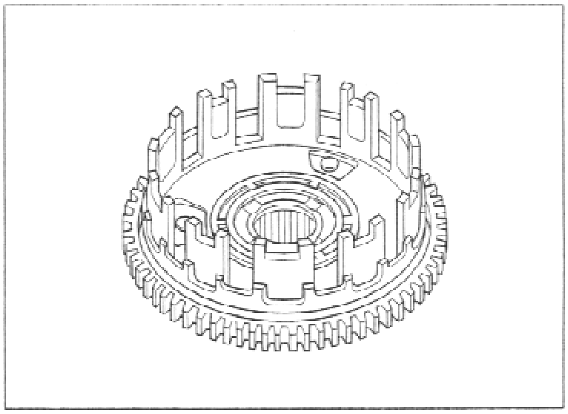
Check each disc plate for warpage on a surface plate using a feeler gauge.

SERVICE LIMIT: 0.30 mm (0.012 in)



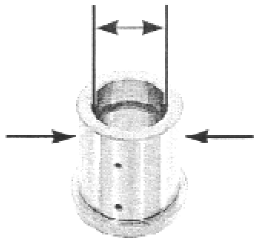
Clutch outer/clutch outer guide

Check the slots of the clutch outer for damage or wear caused by the clutch discs.
Replace if necessary.



Measure the O.D. and I.D. of the clutch outer guide.

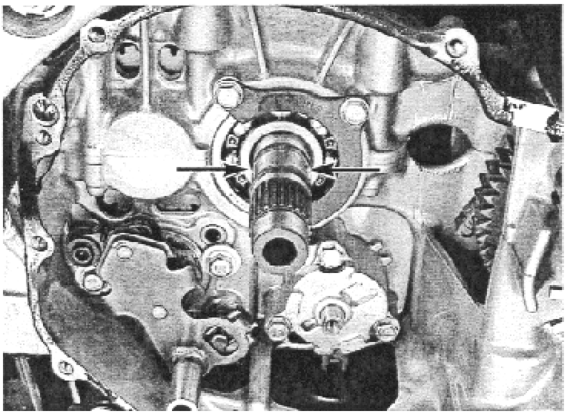
SERVICE LIMITS:
O.D.: 34.97 mm (1.377 in)
I.D.: 25.03 mm (0.985 in)



Mainshaft

Measure the mainshaft O.D. at the clutch outer guide sliding surface.

SERVICE LIMIT: 24.96 mm (0.983 in)

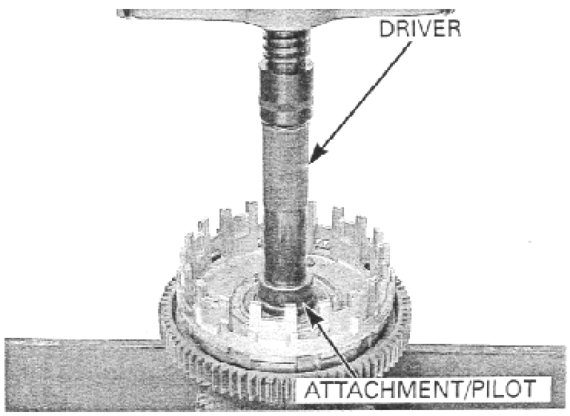


CLUTCH OUTER NEEDLE BEARING REPLACEMENT

Press the needle bearing out of the clutch outer using the special tools.

TOOLS:

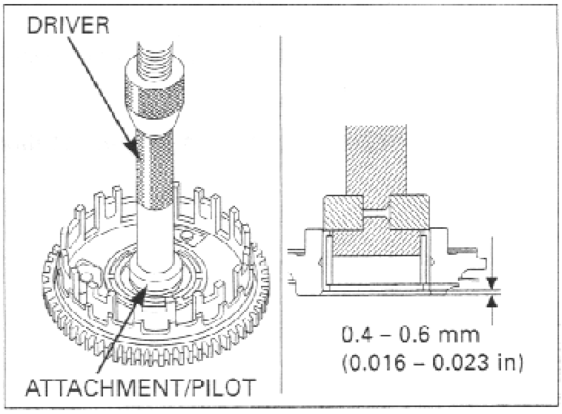
Driver	**07749–0010000**
Attachment, 37 X 40 mm	**07746–0010200**
Pilot, 35 mm	**07746–0040800**



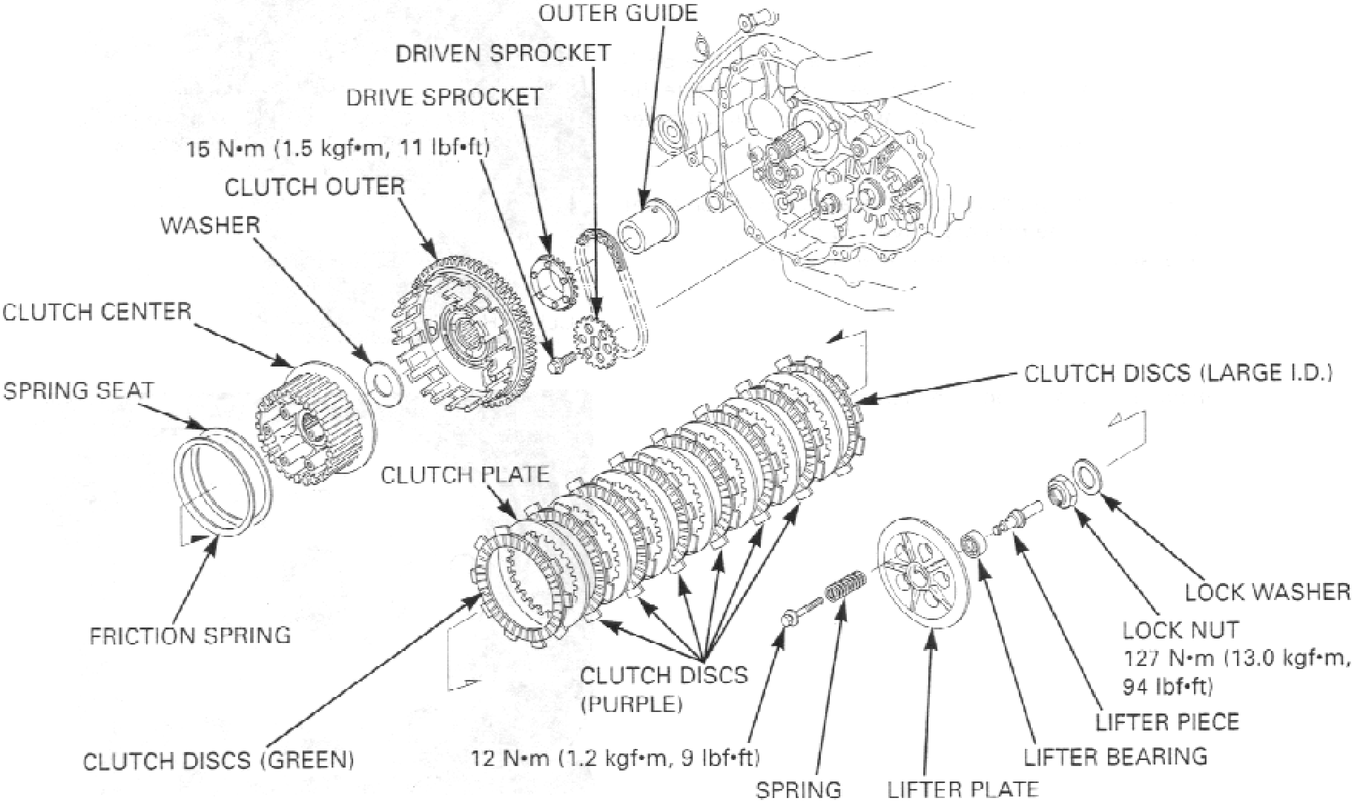
Press a new needle bearing into the clutch outer so the casing of the needle bearing is below 0.4 – 0.6 mm (0.016 – 0.023 in) from the oil pump drive sprocket side of the clutch outer surface as shown.

TOOLS:

Driver	**07749–0010000**
Attachment, 37 x 40 mm	**07746–0010200**
Pilot, 35 mm	**07746–0040800**

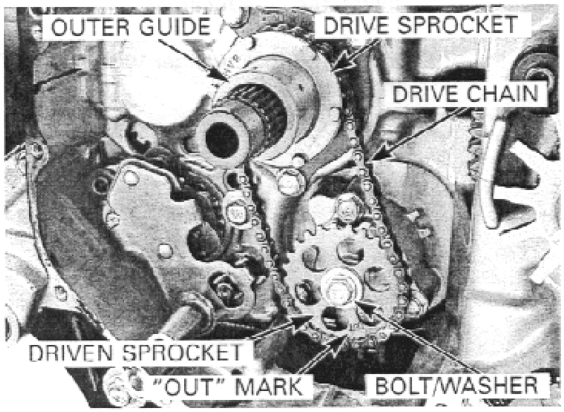


INSTALLATION



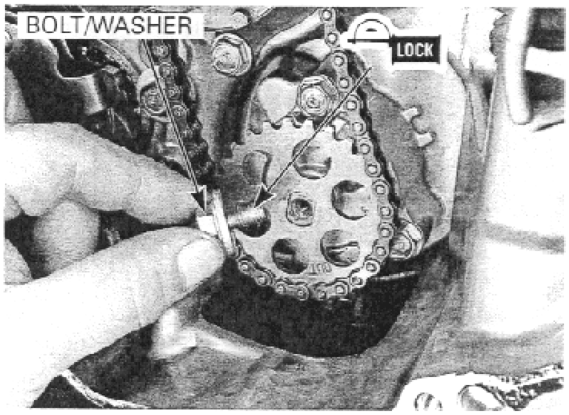
Install the oil pump driven sprocket with the "OUT" mark facing out.

Install the clutch outer guide, oil pump drive/driven sprocket and drive chain as an assembly.



Apply a locking agent to the threads of the oil pump driven sprocket bolt.
Tighten the driven sprocket bolt to the specified torque.

TORQUE: 15 N·m (1.5 kgf·m, 11 lbf·ft)

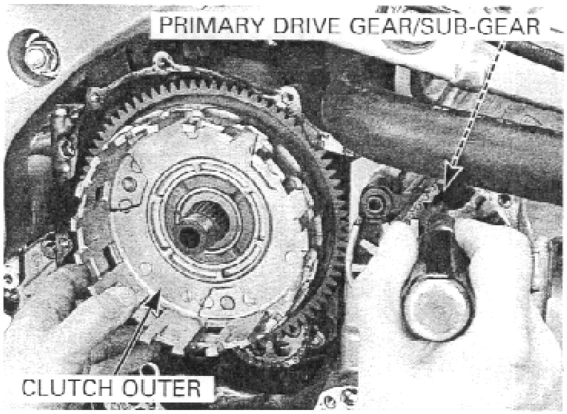


Be careful not to bend the ignition pulse generator rotor tangs.

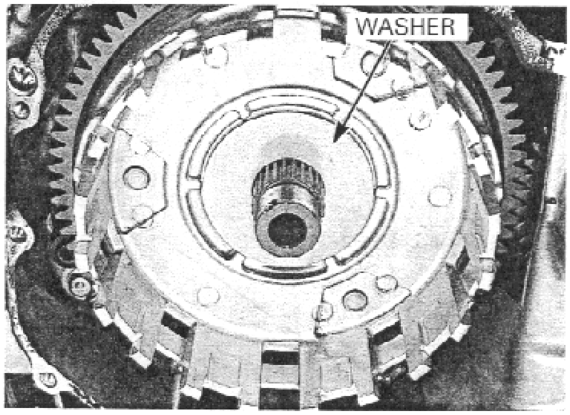
Align the primary drive gear and sub-gear teeth with a 5-mm pin or screwdriver as shown.

Install the clutch outer.
Be sure the clutch outer sits securely onto the positioning tabs of the oil pump drive sprocket. Rotate the oil pump drive chain while installing the clutch outer to properly seat it.

Make sure the primary driven gear of the clutch outer is flush with the primary drive sub-gear.
Release the cam chain tensioner (page 8-26).

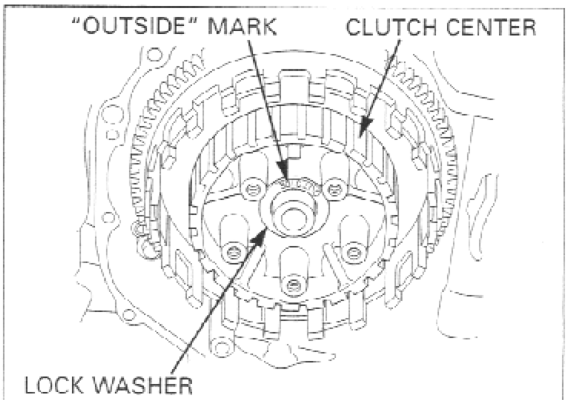


Install the washer onto the clutch outer.



Install the clutch center.

Install the lock washer with its "OUTSIDE" mark facing out.



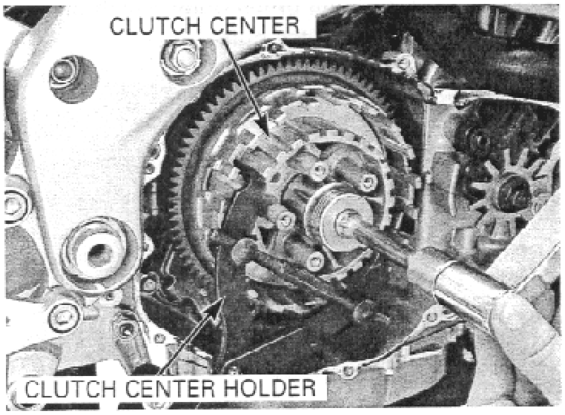
Install the new lock nut.

Hold the clutch center with the clutch center holder, then tighten the lock nut to the specified torque.

TOOL:

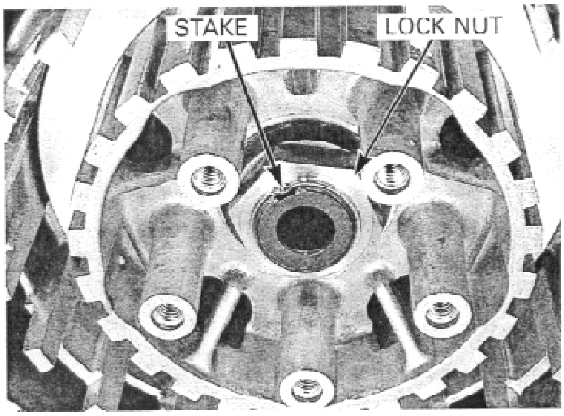
Clutch center holder **07724–0050002 (equivalent commercially available in U.S.A.)**

TORQUE: 127 N•m (13.0 kgf•m, 94 lbf•ft)



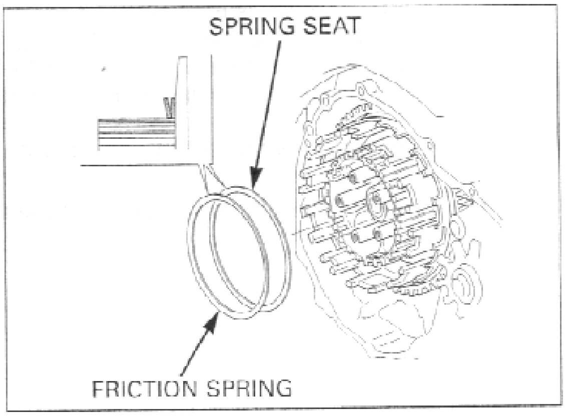
Be careful not to damage the mainshaft threads.

Stake the lock nut into the mainshaft groove with a punch.



Install the spring seat and friction spring onto the clutch center.

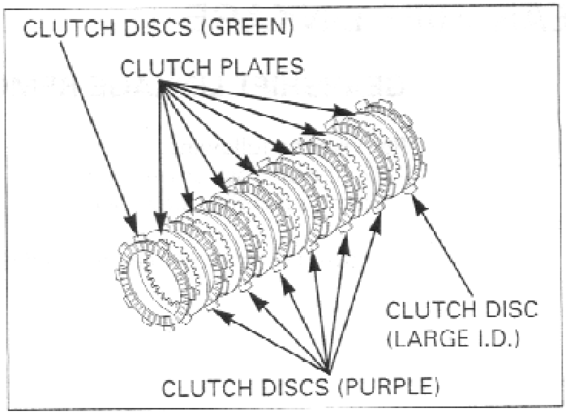
Coat the clutch discs and plates with clean engine oil.



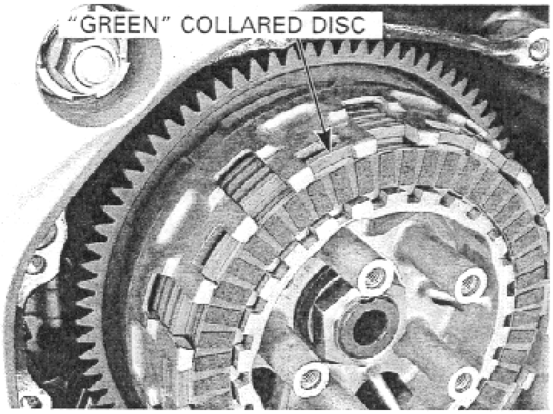
Install the large I.D. disc onto the clutch center as shown.

Install the green disc on the end of the clutch pack.

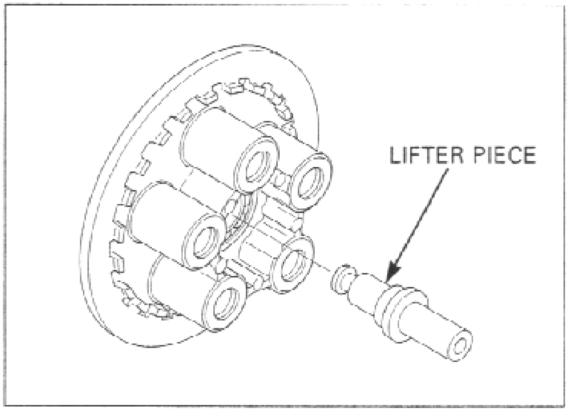
Stack the clutch discs and plates alternately.



Install the green outer clutch disc in the shallow slot on the clutch outer.



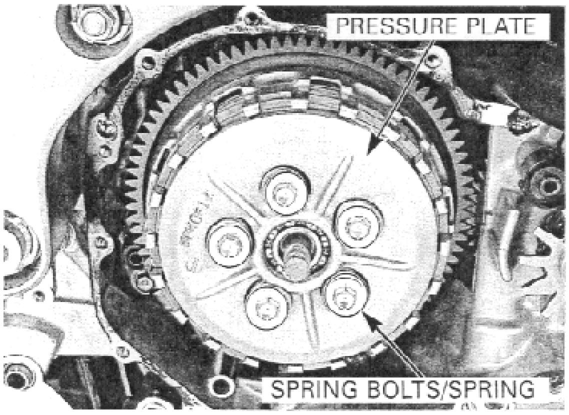
Install the clutch lifter piece into the lifter bearing.



Install the pressure plate.
Install the clutch springs and spring bolts.
Tighten the bolts in a crisscross pattern in two to three steps, then tighten the bolts to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Install the right crankcase cover (page 9-14).

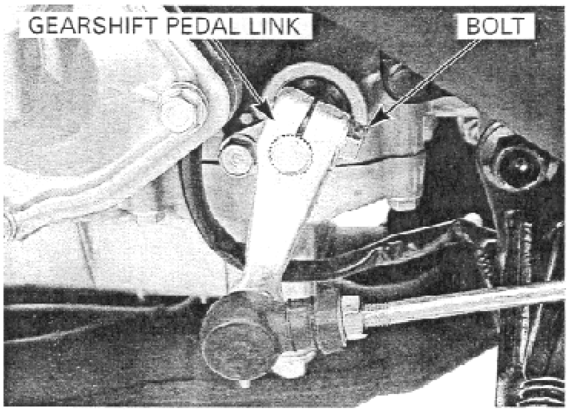


GEARSHIFT LINKAGE

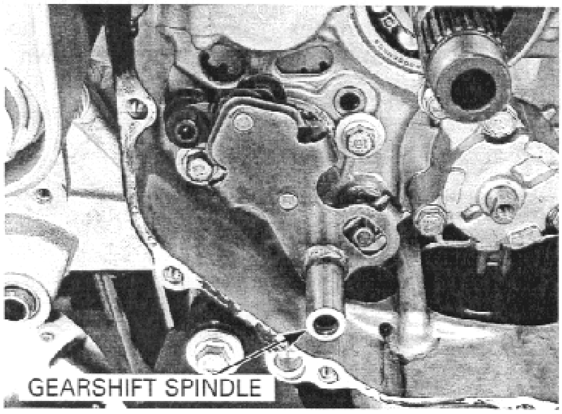
GEARSHIFT LINKAGE REMOVAL

Remove the following:
- Right crankcase cover (page 9-3)
- Clutch assembly (page 9-4)

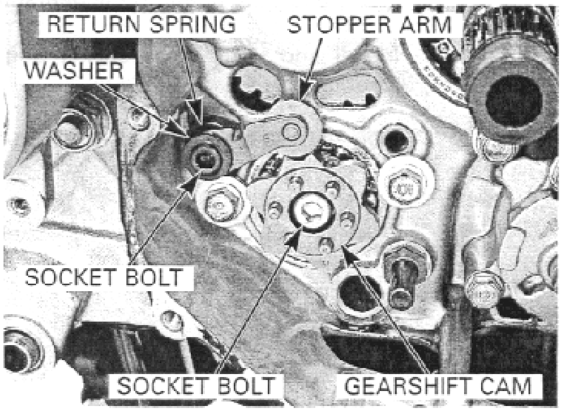
Remove the bolt and gearshift pedal link.



Pull the gearshift spindle assembly and thrust washer out of the crankcase.

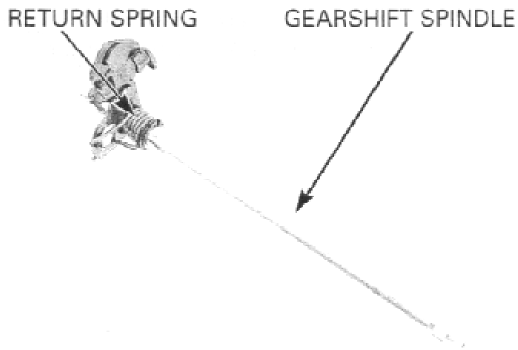


Remove the following:
- Stopper arm socket bolt
- Stopper arm
- Return spring
- Washer
- Dowel pins
- Socket bolt
- Gearshift cam



GEARSHIFT LINKAGE INSPECTION

Check the gearshift spindle for wear, damage or bends.
Check the return spring for fatigue or damage.

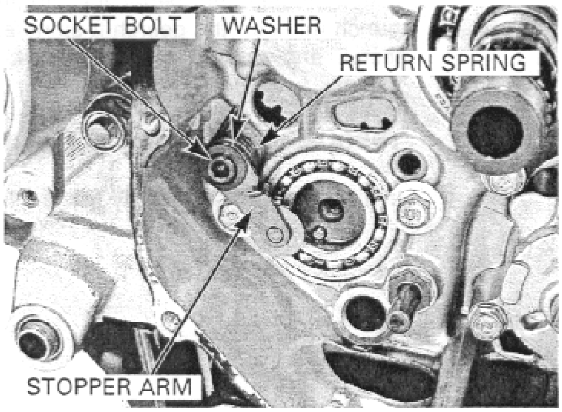


GEARSHIFT LINKAGE INSTALLATION

Install the following:
- Washer
- Return spring
- Stopper arm
- Socket bolt

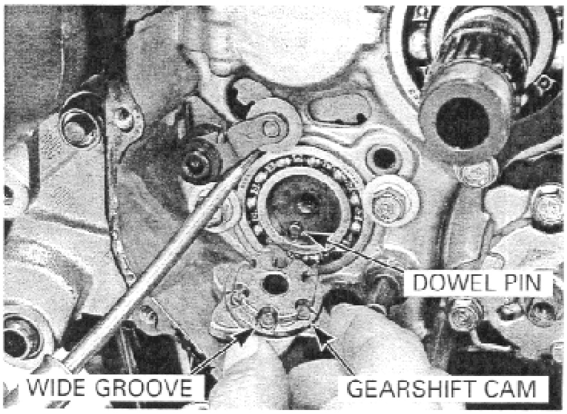
Tighten the stopper arm socket bolt to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)



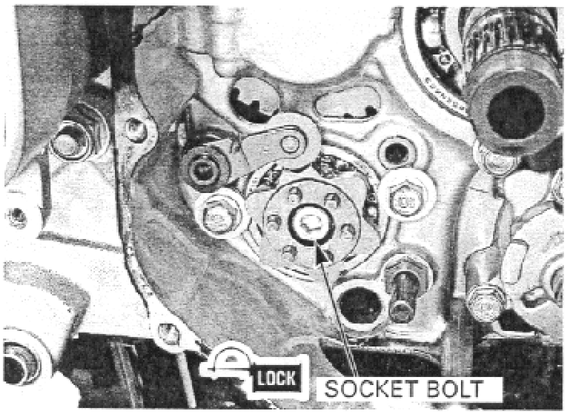
Align the dowel pin on the shift drum center with the wide groove on the gearshift cam.

Install the dowel pin onto the shift drum.
Install the gearshift cam while holding the stopper arm using a screwdriver as shown.

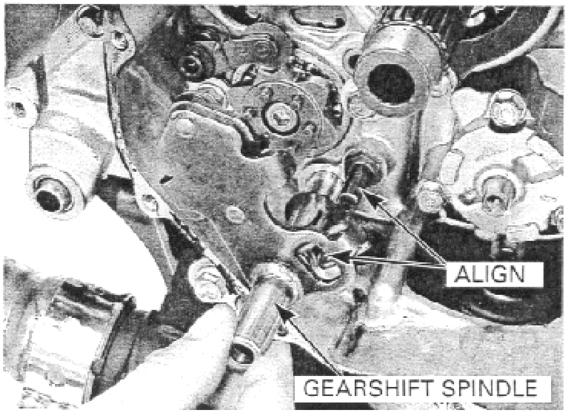


Apply a locking agent to the gearshift cam socket bolt threads.
Install and tighten the socket bolt to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



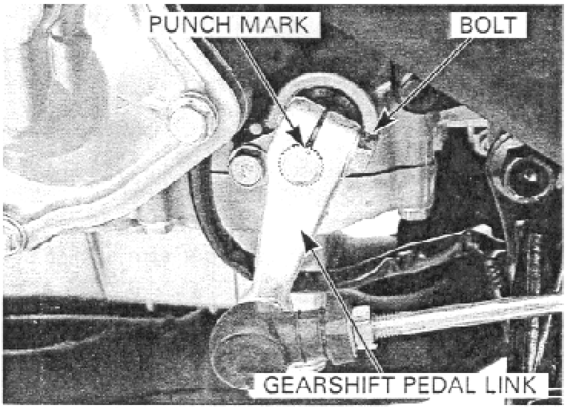
Install the thrust washer and gearshift spindle assembly into the crankcase while aligning the spring ends with the crankcase stopper pin.



Install the gearshift pedal link aligning its slit with the punch mark on the gearshift spindle.
Install and tighten the pinch bolt to the specified torque.

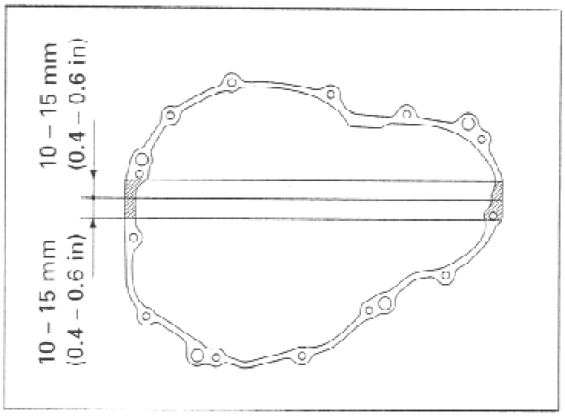
TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Install the clutch assembly (page 9-9).

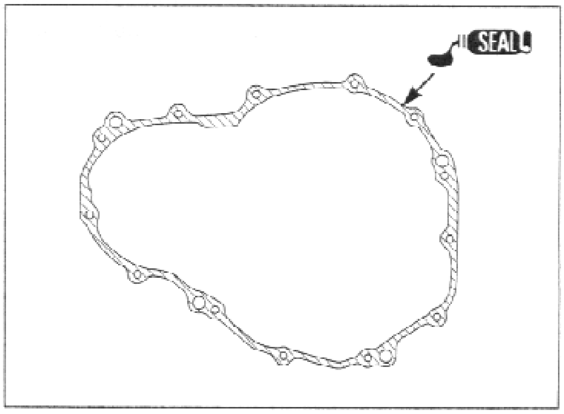


RIGHT CRANKCASE COVER INSTALLATION

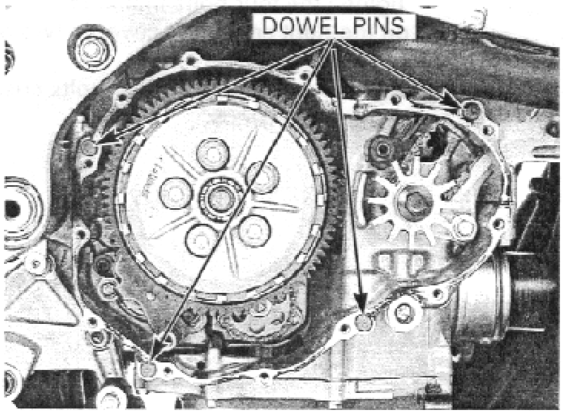
Apply a sealant to the mating surfaces of the crankcase as shown.



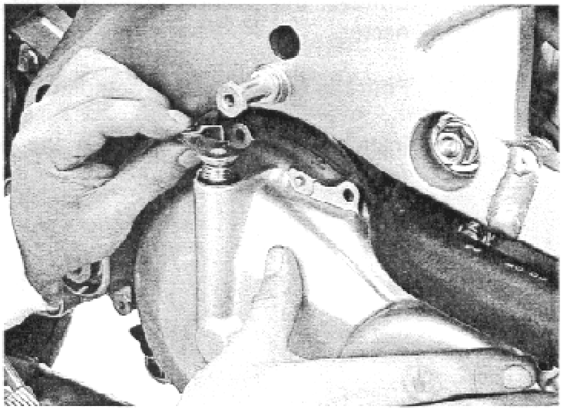
Apply sealant to the mating surface of the right crankcase cover.



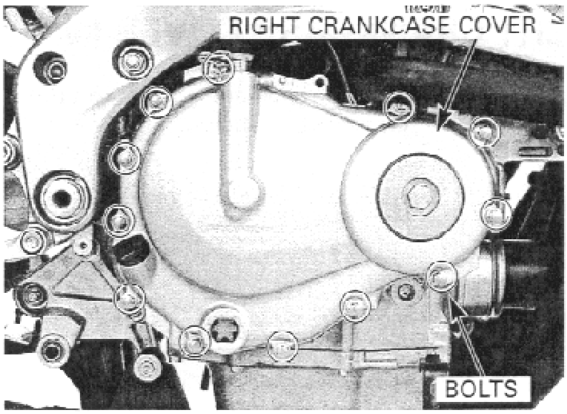
Install the two dowel pins.



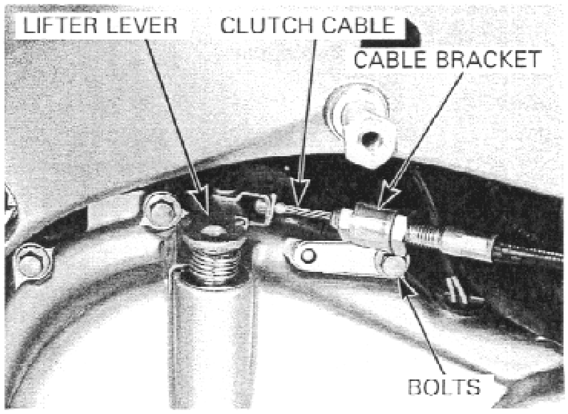
Install the right crankcase cover while turning the lifter arm clockwise to engage the lifter arm groove with the lifter piece flange.



Install and temporarily tighten the right crankcase cover SH bolts.

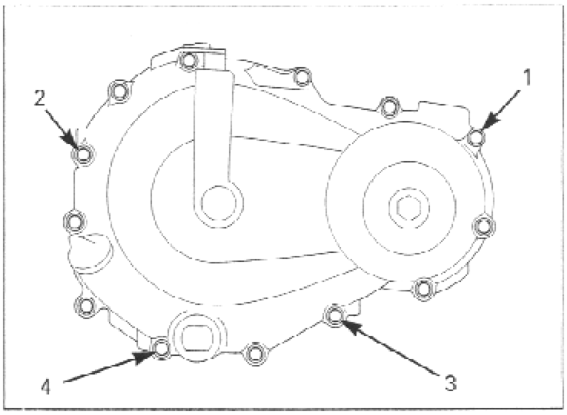


Connect the clutch cable end to the clutch lifter lever, then install the clutch cable bracket with the two bolts.



Tighten the four bolts first in the numerical order cast on the right crankcase cover in two or three steps.

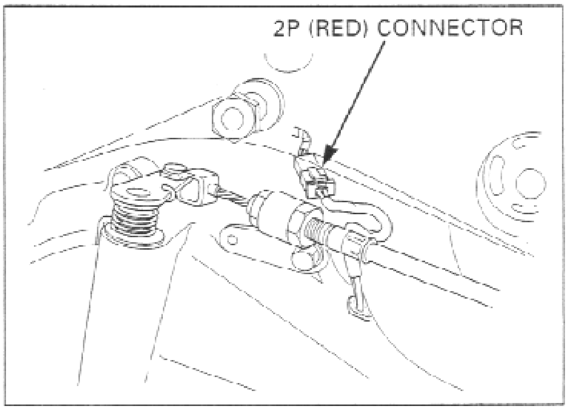
Tighten the the other cover bolts crisscross pattern in two to three steps.



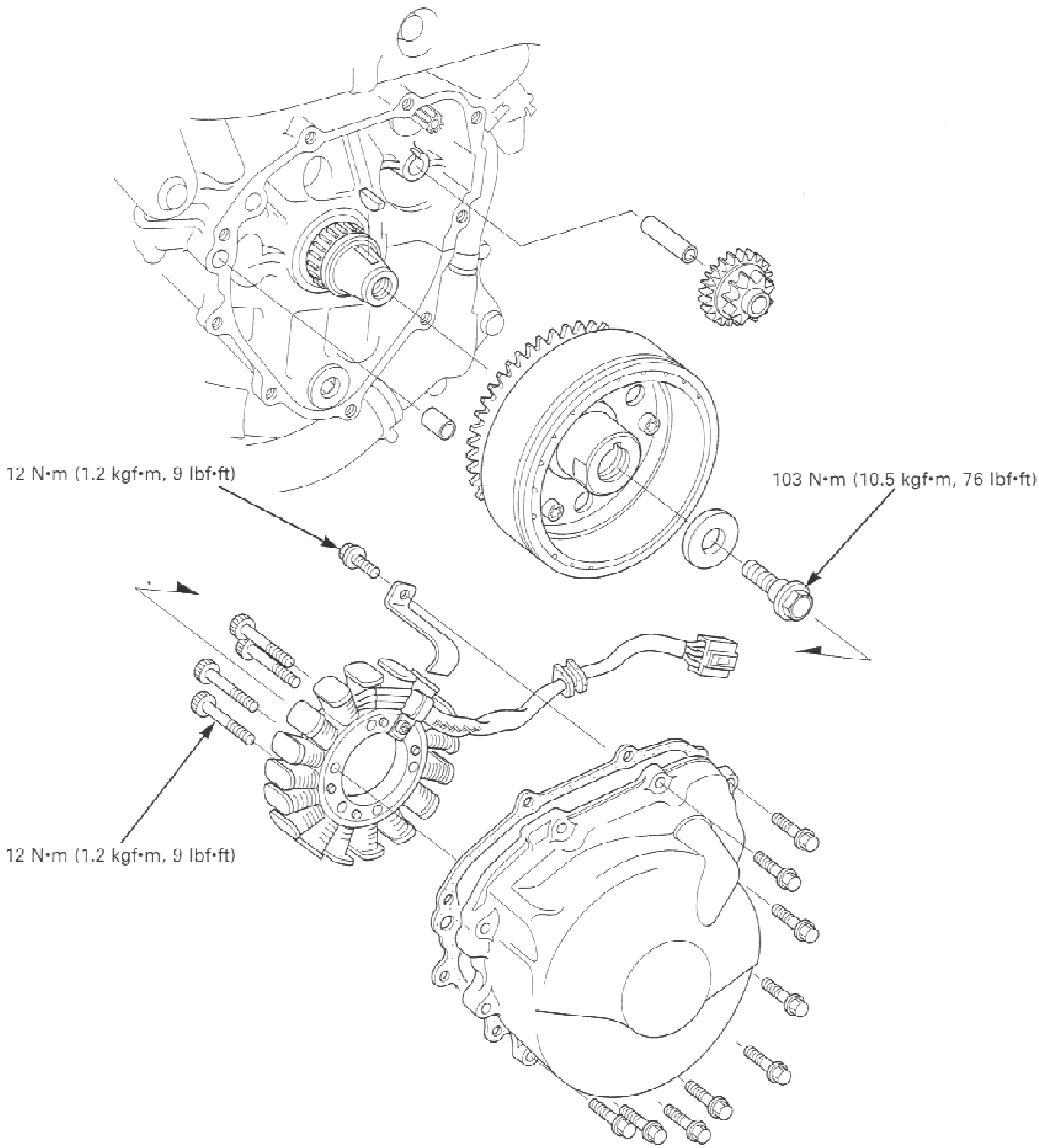
Connect the ignition pulse generator 2P (Red) connector.

Pour the recommended engine oil (page 3-14).

Install the removed parts in the reverse order of removal.



MEMO


12 N•m (1.2 kgf•m, 9 lbf•ft)
103 N•m (10.5 kgf•m, 76 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)

10. ALTERNATOR/STARTER CLUTCH

SERVICE INFORMATION

GENERAL

- This section covers service of the alternator stator, flywheel and starter clutch. All service can be done with the engine installed in the frame.
- Refer to section 16 for alternator stator inspection.
- Refer to section 18 for starter motor servicing.

SPECIFICATIONS

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter driven gear boss O.D.	51.699 – 51.718 (2.0354 – 2.0361)	51.684 (2.0348)

10

TORQUE VALUES

Alternator stator socket bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Starter clutch outer socket bolt	16 N•m (1.6 kgf•m, 12 lbf•ft)	Apply a locking agent to the threads.
Flywheel flange bolt	103 N•m (10.5 kgf•m, 76 lbf•ft)	Apply oil to the threads.
Stator wire clamp flange bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	CT bolt.

TOOLS

Flywheel holder	07725-0040000	Equivalent commercially available in U.S.A.
Rotor puller	07733-0020001 or 07933-3950000	

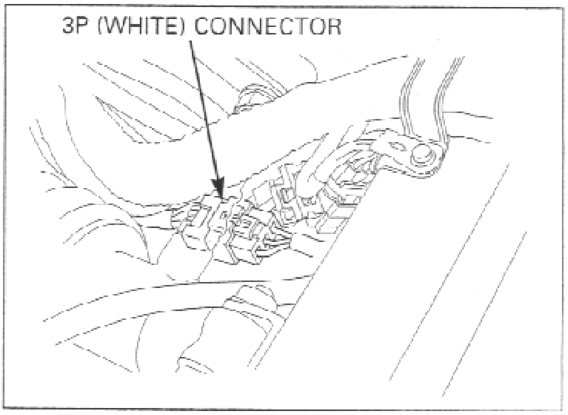
TROUBLESHOOTING

Engine does not turn
- Faulty starter clutch
- Damaged reduction gear/shaft

ALTERNATOR COVER REMOVAL

Remove the throttle body (page 5-62).

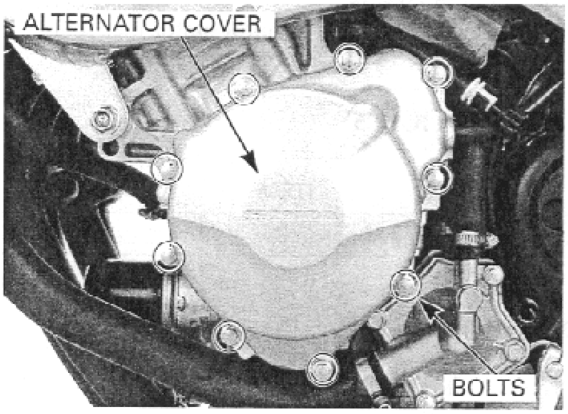
Disconnect the alternator 3P (Natural) connector.



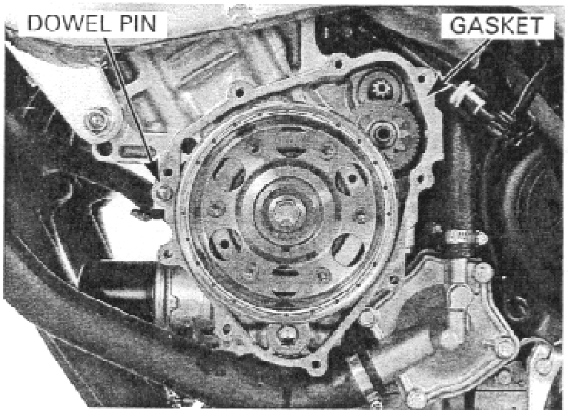
The alternator cover (stator) is magnetically attached to the flywheel, be careful during removal.

Remove the alternator cover SH bolts and alternator cover.

The engine oil will run out when the alternator cover is removed. Set a clean oil pan under the engine and add the recommended oil to the specified level after installation.



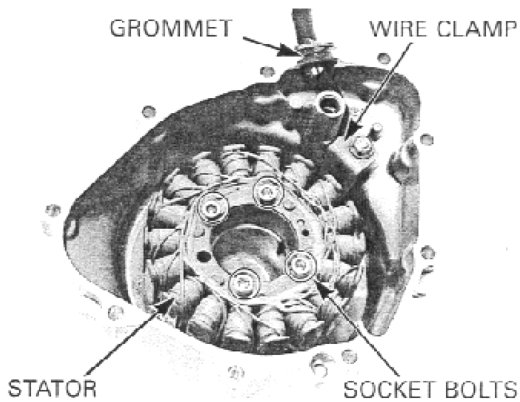
Remove the gasket and dowel pin.



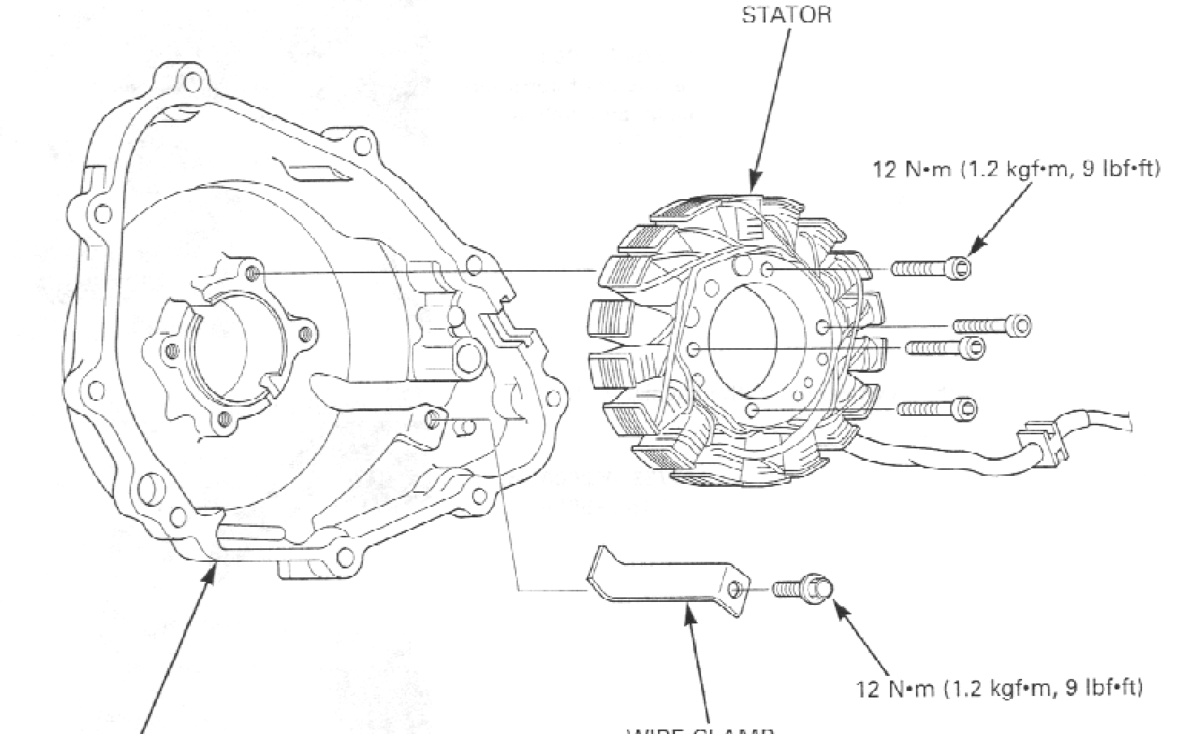
STATOR

REMOVAL

Remove the alternator wire grommet from the alternator cover.
Remove the socket bolt and stator wire clamp.
Remove the socket bolts and stator.



INSTALLATION



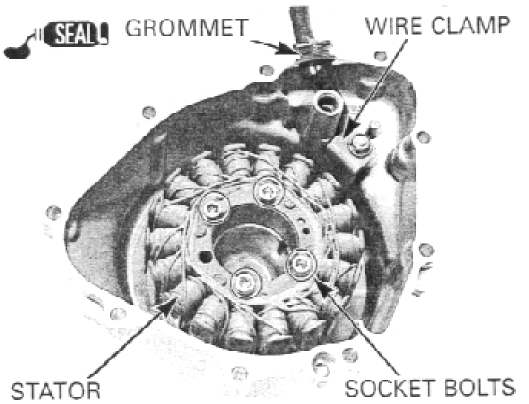
Install the stator into the alternator cover.

Apply sealant to the wire grommet, then install the wire grommet into the alternator groove securely. Install and tighten the stator mounting socket bolts to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Install the wire clamp and tighten the bolt to the specified torque.

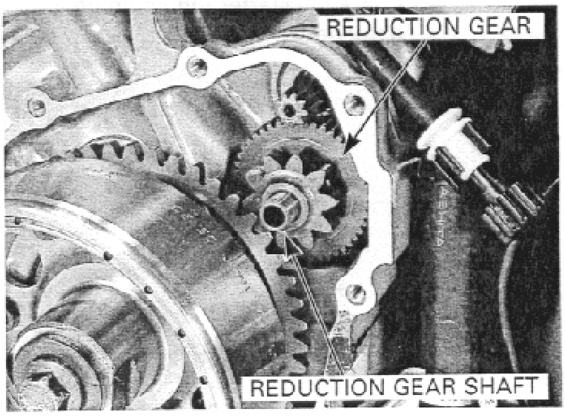
TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)



FLYWHEEL REMOVAL

Remove the alternator cover (page 10-2).

Remove the starter reduction gear shaft and reduction gear.

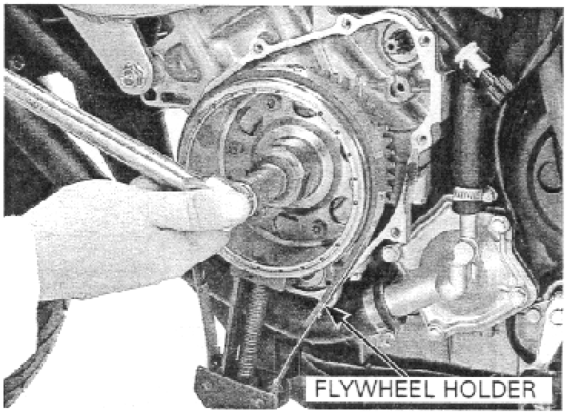


Hold the flywheel using the flywheel holder, then remove the flywheel bolt.

TOOL:

Flywheel holder	**07725–0040000 (equivalent commercially available in U.S.A.)**

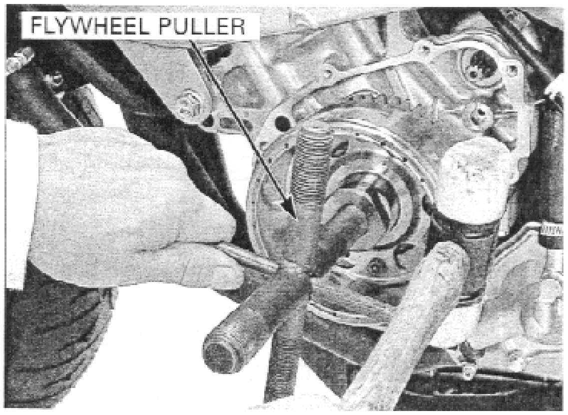
Remove the washer.



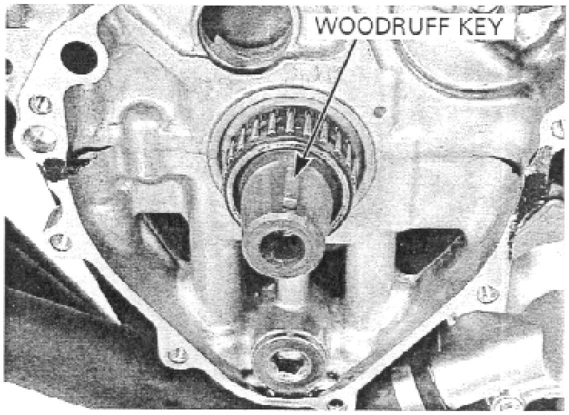
Remove the flywheel using the special tool.

TOOL:

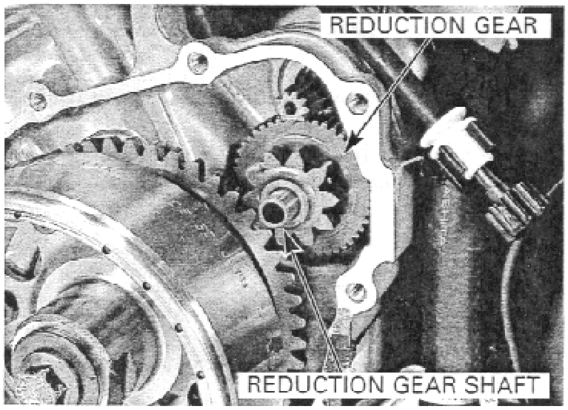
Rotor puller	**07733–0020001** or **07933–3950000**



Remove the woodruff key.



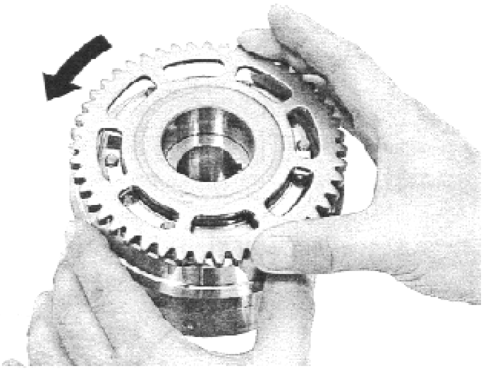
Check the starter reduction gear and shaft for wear or damage.



STARTER CLUTCH

INSPECTION

Check the operation of the one-way clutch by turning the driven gear.
You should be able to turn the driven gear counter-clockwise smoothly, but the gear should not turn clockwise.



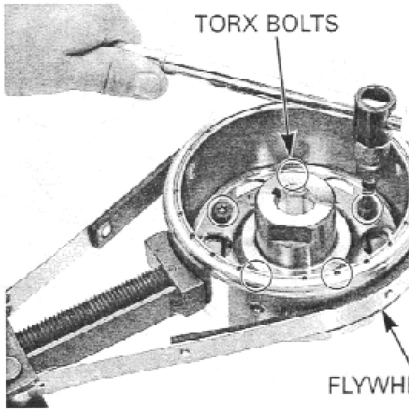
DISASSEMBLY

Remove the starter driven gear by turning it counter-clockwise.

Hold the flywheel with a flywheel holder and remove the starter clutch mounting torx bolts.

TOOL:
Flywheel holder **07725–0040000 (equivalent commercially available in U.S.A.)**

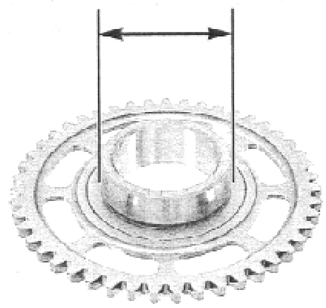
Remove the starter one-way clutch assembly.



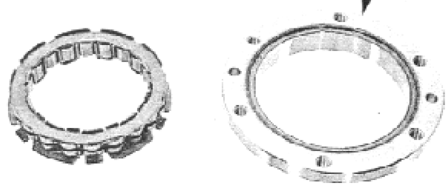
Check the starter driven gear for abnormal wear or damage.

Measure the starter driven gear boss O.D.

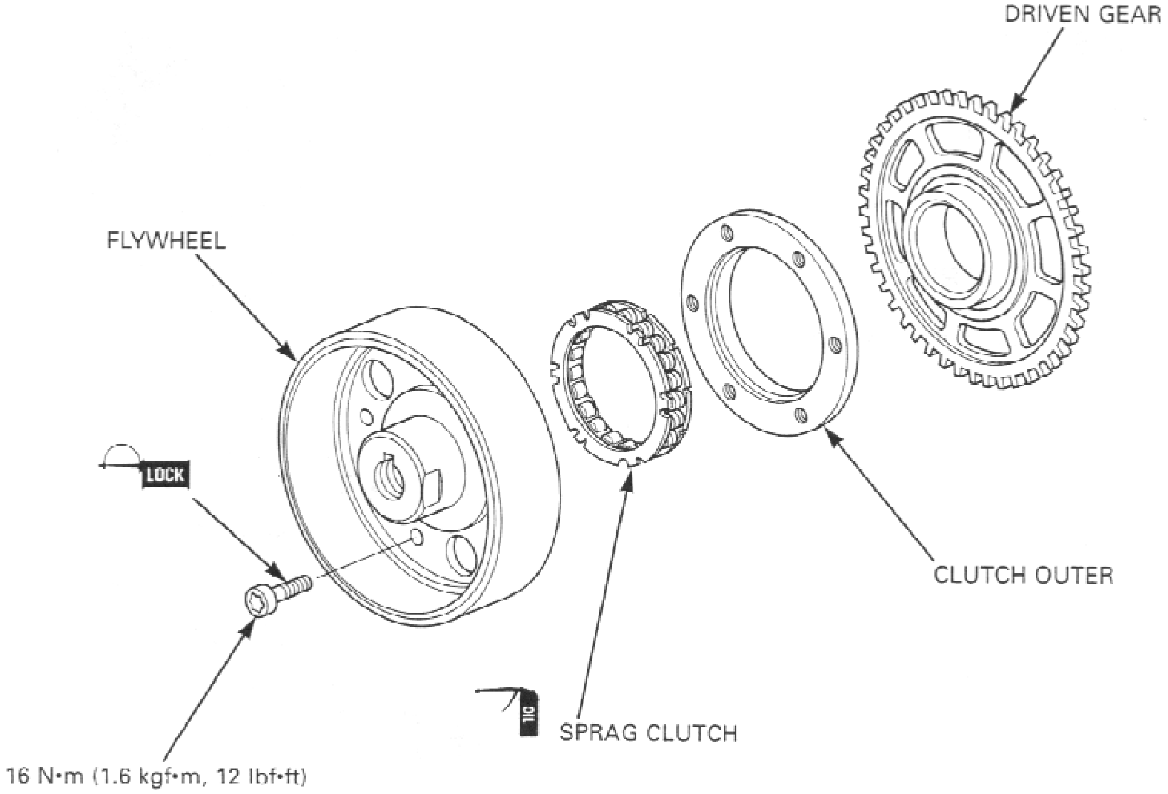
SERVICE LIMIT: 51.684 mm (2.0348 in)



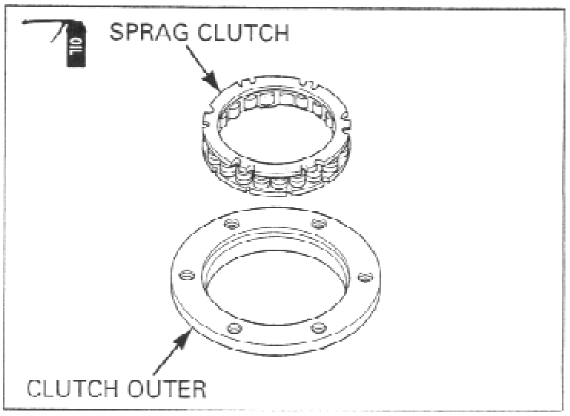
Check the one-way clutch for wear or damage and replace if necessary.



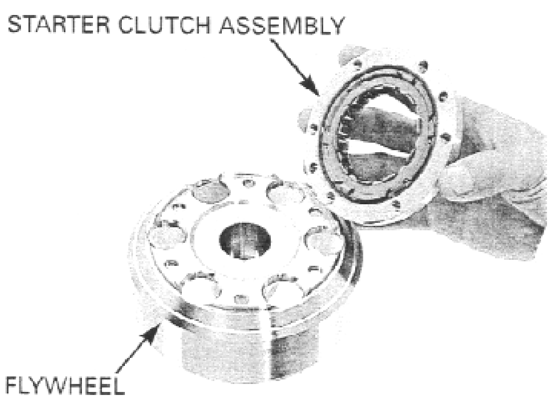
ASSEMBLY



Apply engine oil to the sprag clutch contacting surfaces.
Install the sprag clutch into the starter clutch outer with the flange side facing out.



Install the starter one-way clutch assembly onto the flywheel.

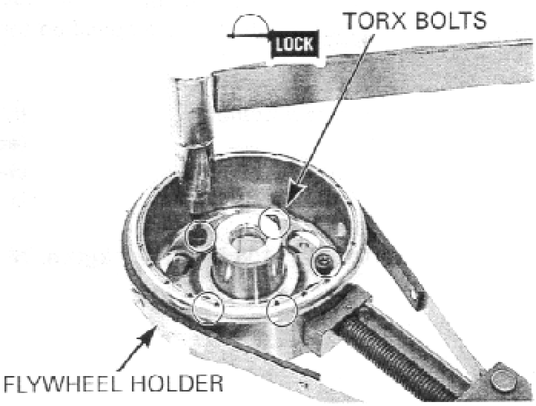


Apply a locking agent to the starter clutch outer mounting bolt threads.
Hold the flywheel with a flywheel holder and tighten the starter clutch mounting torx bolts.

TOOL:

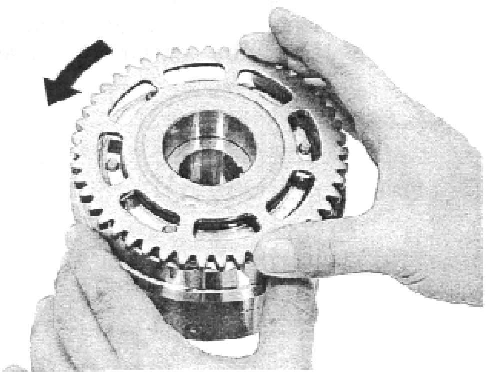
Flywheel holder **07725–0040000 (equivalent commercially available in U.S.A.)**

TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)



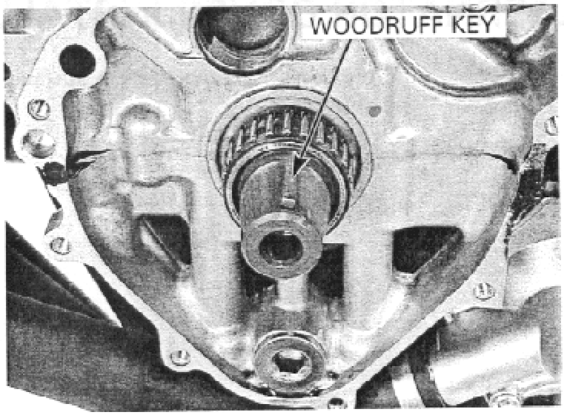
Install the starter driven gear into the one-way clutch while turning it counterclockwise.

Recheck the one-way clutch operation.
You should be able to turn the driven gear counterclockwise smoothly, but the gear should not turn clockwise.



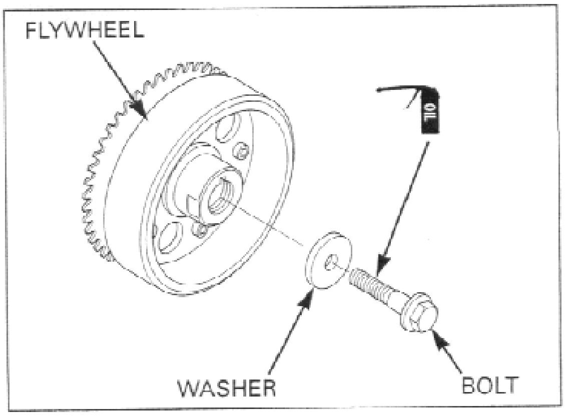
FLYWHEEL INSTALLATION

Clean any oil from the crankshaft taper.
Install the woodruff key into the groove in the crankshaft.



Install the flywheel aligning the key way in the flywheel with the woodruff key on the crankshaft.

Apply oil to the flywheel bolt threads and seating surface.
Install the washer and flywheel bolt.

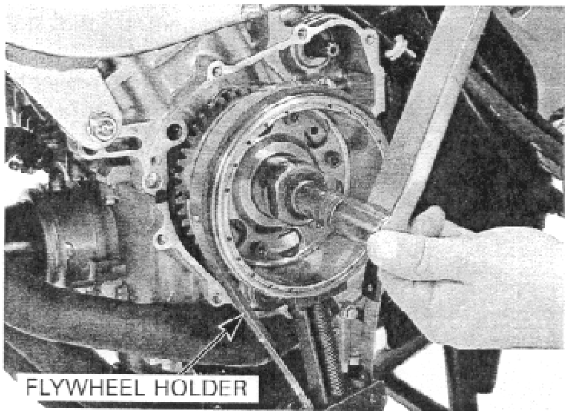


Hold the flywheel using the flywheel holder, then tighten the bolt to the specified torque.

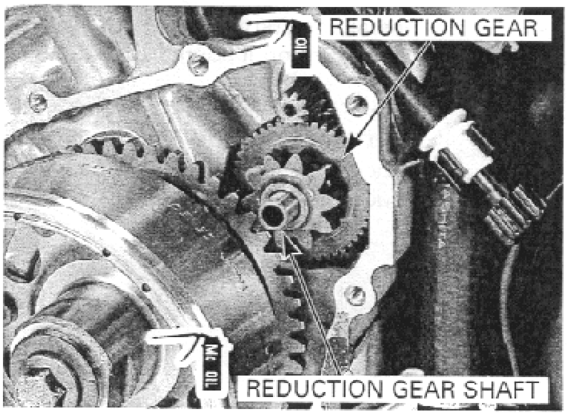
TOOL:

Flywheel holder	**07725–0040000 (equivalent commercially available in U.S.A.)**

TORQUE: 103 N•m (10.5 kgf•m, 76 lbf•ft)

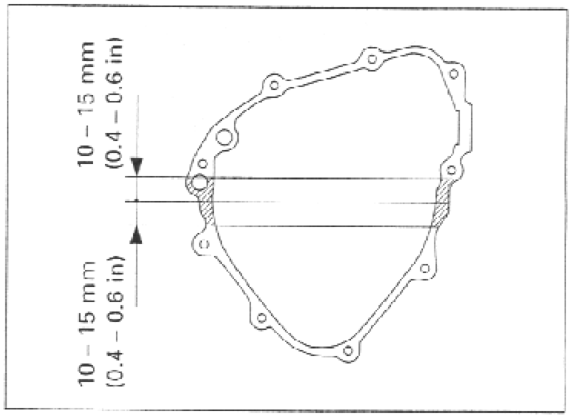


Apply molybdenum oil solution to the starter reduction gear shaft.
Apply oil to the starter reduction gear.
Install the starter idle gear and shaft onto the crankcase.

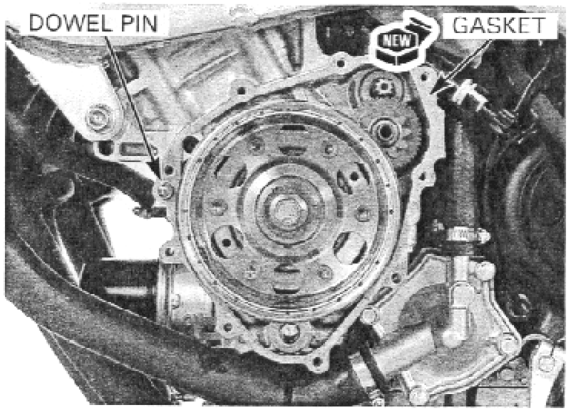


ALTERNATOR COVER INSTALLATION

Apply sealant to the mating surface of the crankcase as shown.



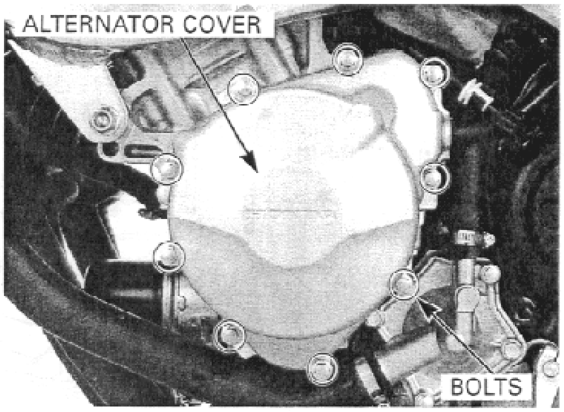
Install the dowel pin and new gasket.



The alternator cover (stator) is magnetically attached to the flywheel, be careful during installation.

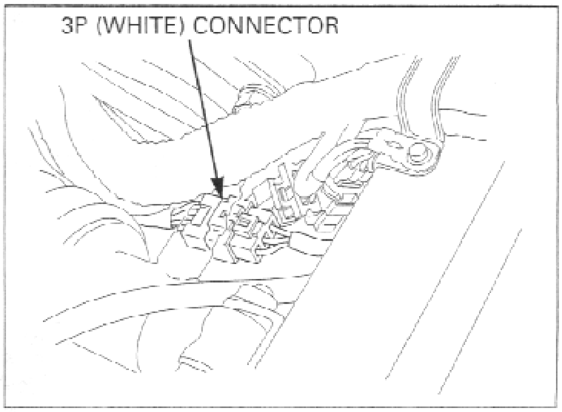
Install the alternator cover.

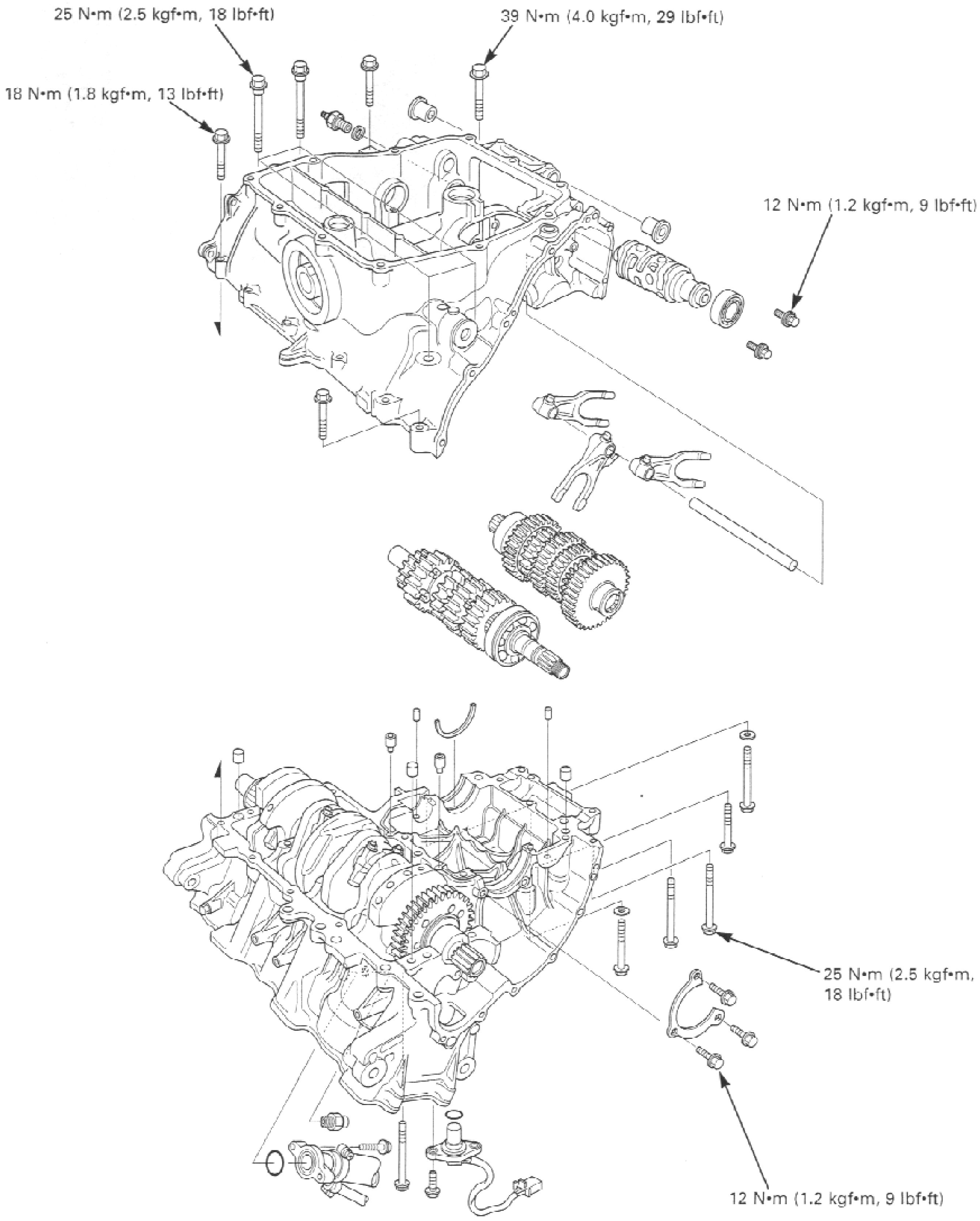
Install and tighten the bolts securely.



Connect the alternator 3P (Natural) connector.

Install the throttle body (page 5-68)




25 N•m (2.5 kgf•m, 18 lbf•ft)
39 N•m (4.0 kgf•m, 29 lbf•ft)
18 N•m (1.8 kgf•m, 13 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)
25 N•m (2.5 kgf•m, 18 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)

11. CRANKCASE/TRANSMISSION

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the following:
  - Transmission
  - Crankshaft (Section 12)
  - Piston/connecting rod (Section 12)
- The following components must be removed before separating the crankcase:
  - Alternator/flywheel (Section 10)
  - Clutch/gearshift linkage (Section 9)
  - Cylinder head (Section 8)
  - Engine (Section 7)
  - Oil pan, oil pump and oil cooler (Section 4)
  - Starter motor (Section 18)
  - Water pump (Section 6)
- Be careful not to damage the crankcase mating surfaces when servicing.
- Prior to assembling the crankcase halves, apply sealant to their mating surfaces. Wipe off any excess sealant thoroughly.

11

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Shift fork, fork shaft	I.D.		12.000 – 12.021 (0.4724 – 0.4733)	12.03 (0.474)
	Claw thickness		5.93 – 6.00 (0.233 – 0.236)	5.9 (0.23)
	Shift fork shaft O.D.		11.957 – 11.968 (0.4707 – 0.4712)	11.95 (0.470)
Transmission	Gear I.D.	M5, M6	28.000 – 28.021 (1.1024 – 1.1032)	28.04 (1.104)
		C2, C3, C4	31.000 – 31.025 (1.2205 – 1.2215)	31.04 (1.222)
	Gear bushing O.D.	M5, M6	27.959 – 27.980 (1.1007 – 1.1016)	27.94 (1.100)
		C2	30.955 – 30.980 (1.2187 – 1.2197)	30.94 (1.218)
		C3, C4	30.950 – 30.975 (1.2185 – 1.2195)	30.93 (1.218)
	Gear-to-bushing clearance	M5, M6	0.020 – 0.062 (0.0008 – 0.0024)	0.10 (0.004)
		C2	0.020 – 0.070 (0.0008 – 0.0028)	0.10 (0.004)
		C3, C4	0.025 – 0.075 (0.0010 – 0.0030)	0.11 (0.004)
	Gear bushing I.D.	M5	24.985 – 25.006 (0.9837 – 0.9845)	25.016 (0.9849)
		C2	27.985 – 28.006 (1.1018 – 1.1026)	28.021 (1.1032)
	Mainshaft O.D.	at M5	24.967 – 24.980 (0.9830 – 0.9835)	24.96 (0.983)
	Countershaft O.D.	at C2	27.967 – 27.980 (1.1011 – 1.1016)	27.96 (1.101)
	Bushing-to-shaft clearance	M5	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)
		C2	0.005 – 0.039 (0.0002 – 0.0015)	0.06 (0.002)

TORQUE VALUES

Mainshaft bearing set plate bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads.
Gearshift drum bearing/fork shaft set bolt/washer	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply a locking agent to the threads.
Crankcase bolt (main journal)	25 N•m (2.6 kgf•m, 19 lbf•ft)	Apply molybdenum disulfide oil to the threads and seating surface (after removing anti-rust oil additive).
Crankcase bolt, 10 mm	39 N•m (4.0 kgf•m, 29 lbf•ft)	
7 mm	18 N•m (1.8 kgf•m, 13 lbf•ft)	
Crankcase bolt (upper side 8 mm bolt)	25 N•m (2.5 kgf•m, 18 lbf•ft)	

TOOLS

Inner driver C	07746–0030100
Attachment, 25 mm I.D.	07746–0030200

TROUBLESHOOTING

Hard to shift
- Improper clutch operation (section 9)
- Incorrect transmission oil weight
- Bent shift fork
- Bent shift fork shaft
- Bent shift fork claw
- Damaged shift drum cam groove
- Bent gearshift spindle

Transmission jumps out of gear
- Worn gear dogs
- Worn gear shifter groove
- Bent shift fork shaft
- Broken shift drum stopper arm
- Broken shift drum stopper arm spring
- Worn or bent shift forks
- Broken gearshift spindle return spring

Excessive engine noise
- Worn or damaged transmission gear
- Worn or damaged transmission bearings

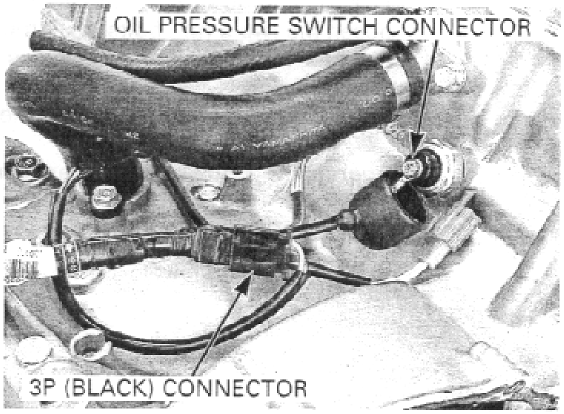
CRANKCASE SEPARATION

Refer to Service Information (page 11-1) for removal of the necessary parts before separating the crankcase.

Disconnect the following connectors and remove the engine sub-harness;

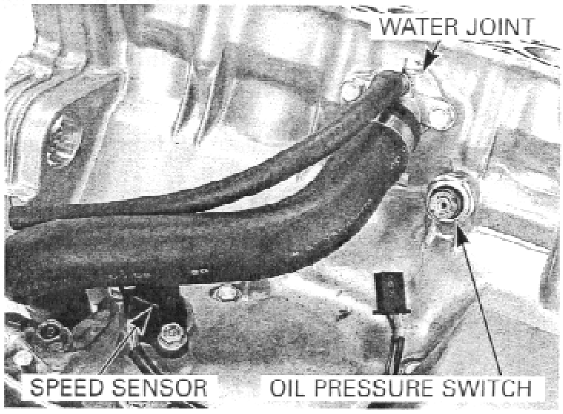
Remove the speed sensor before separating the crankcase. Do not separate or assemble the crankcase with the speed sensor installed.

- Speed sensor 3P (Black) connector
- Oil pressure switch connector
- Neutral switch connector

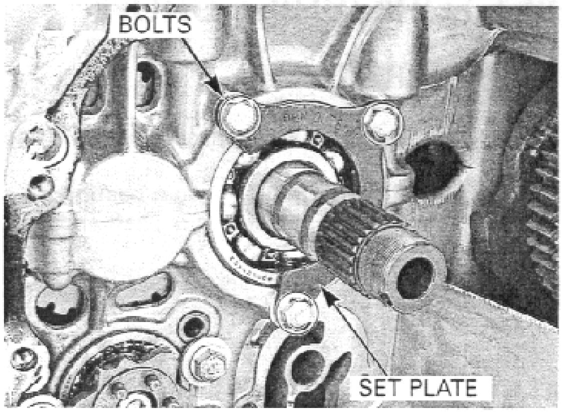


Remove the following:
- Oil pressure switch (page 19-16)
- Speed sensor (page 19-12)
- Cam chain tensioner/guide (page 8-21)

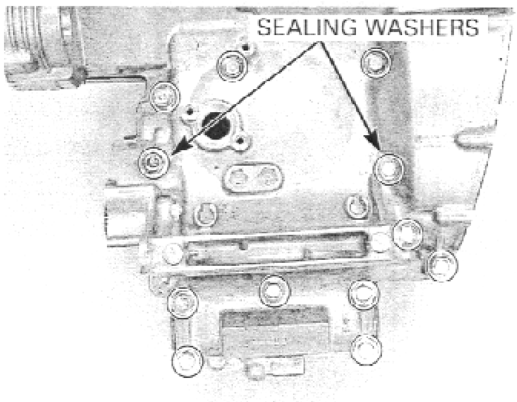
Remove the bolts and water hose joint.



Remove the mainshaft bearing set plate bolts and plate.

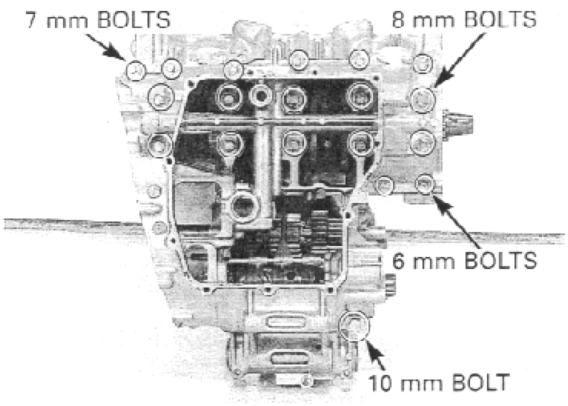


Loosen the seven 6-mm bolts and five 8-mm bolts in a crisscross pattern in two or three steps.
Remove the bolts and sealing washers.



Place the engine with the upper side down.
Loosen the two 6-mm bolts, six 7-mm bolts, ten 8-mm bolts and 10-mm bolt in a crisscross pattern in two or three steps.
Remove the bolts and sealing washers.

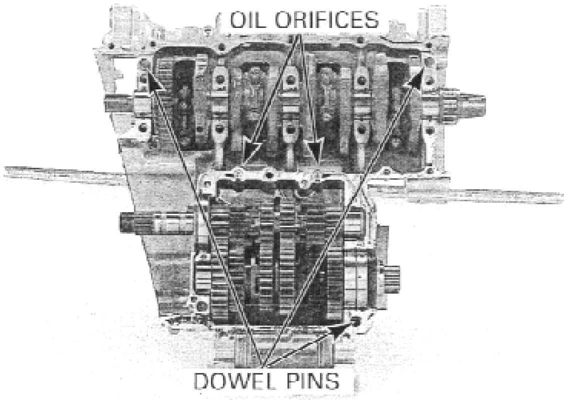
Separate the lower crankcase from the upper crankcase.



Remove the three dowel pins and two oil orifices.

If necessary, remove the swingarm pivot collar from the lower crankcase.

Clean any sealant off from the crankcase mating surface.

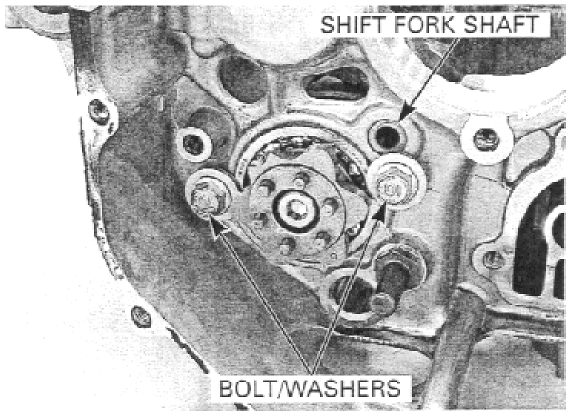


SHIFT FORK/SHIFT DRUM

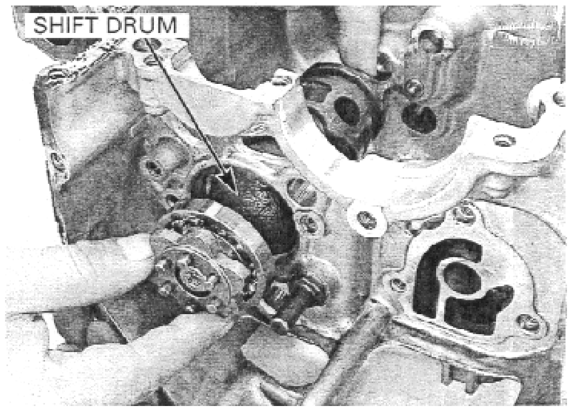
REMOVAL

Separate the crankcase halves (page 11-3).

Remove the shift drum bearing set plate bolt/washer.
Remove the shift fork shaft and shift forks.



Remove the shift drum.



SHIFT DRUM/SHIFT FORK INSPECTION

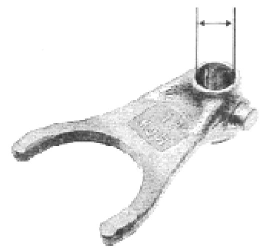
Check the shift fork guide pin for abnormal wear or damage

Measure the shift fork I.D.

SERVICE LIMIT: 12.03 mm (0.474 in)

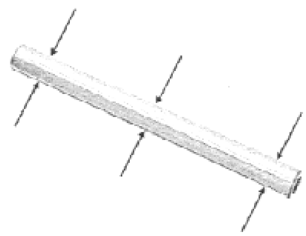
Measure the shift fork claw thickness.

SERVICE LIMIT: 5.9 mm (0.23 in)



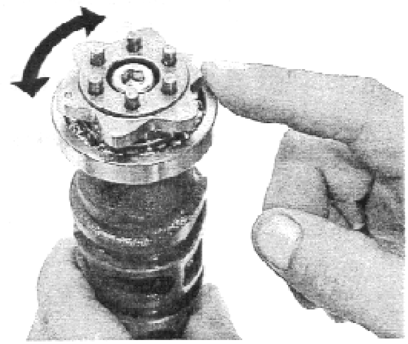
Measure the shift fork shaft O.D.

SERVICE LIMIT: 11.95 mm (0.470 in)



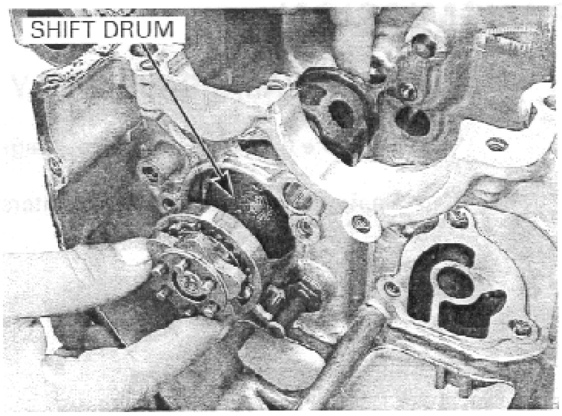
Inspect the shift drum guide grooves for abnormal wear or damage.

Turn the outer race of the shift drum bearing with your finger.
The bearing should turn smoothly and freely without excessive play.
If necessary, replace the bearing.

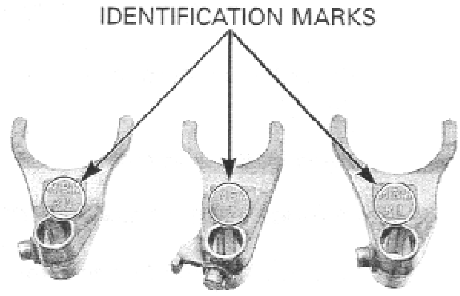


INSTALLATION

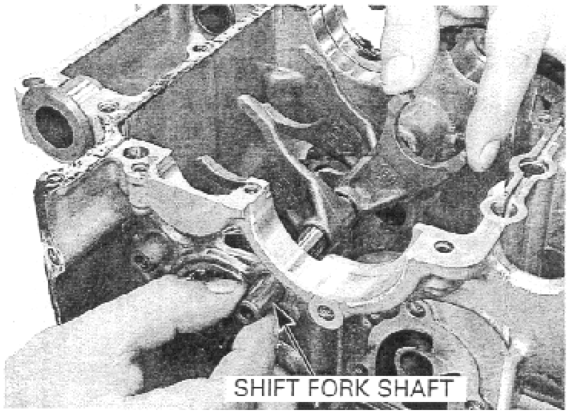
Install the shift drum into the lower crankcase.



The shift forks have the following location marks:
"RL" for right and left
"C" for center



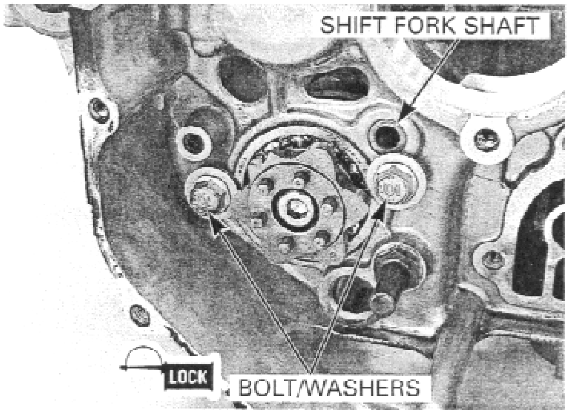
Install the shift forks into the shift drum guide groove with the identification marks facing toward the right side of the engine and insert the fork shaft.



Apply a locking agent to the threads of the bolt/washer.
Install the bolt/washer, then tighten them to the specified torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Assemble the crankcase halves (page 11-11).

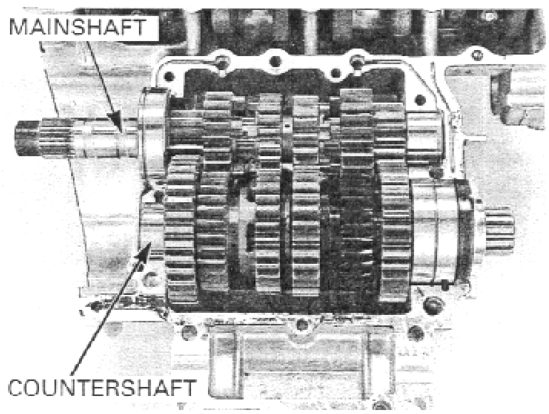


TRANSMISSION

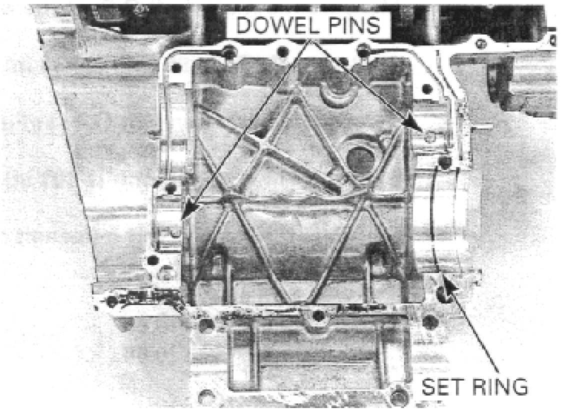
REMOVAL/DISASSEMBLY

Separate the crankcase halves (page 11-3).

Remove the mainshaft and countershaft assemblies.



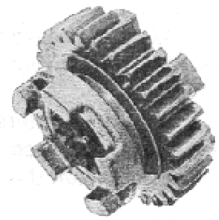
Remove the dowel pins and countershaft bearing set ring.



Disassemble the mainshaft and countershaft.
Clean all disassembled parts in solvent thoroughly.

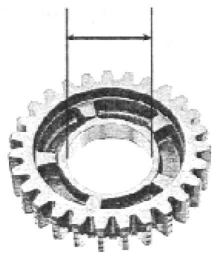
Check the mainshaft and countershaft needle bearings for abnormal wear or damage.

Check the gear shifter groove for abnormal wear or damage.



Check the gear dogs, dog holes and teeth for abnormal wear or lack of lubrication.

Measure the I.D. of each gear.



SERVICE LIMITS:
M5, M6: 28.04 mm (1.104 in)
C2, C3, C4: 31.04 mm (1.222 in)

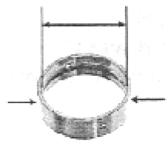
Measure the O.D. of each gear bushing.

SERVICE LIMITS:
M5, M6: 27.94 mm (1.100 in)
C2: 30.94 mm (1.218 in)
C3, C4: 30.93 mm (1.218 in)

Calculate the gear-to bushing clearance.

M5, M6: 0.10 mm (0.004 in)
C2: 0.10 mm (0.004 in)
C3, C4: 0.11 mm (0.004 in)

Measure the O.D. of each gear bushing.



M5: 25.016 mm (0.9849 in)
C2: 28.021 mm (1.1032 in)

Check the mainshaft and countershaft for abnormal wear or damage.

Measure the mainshaft O.D. at the M5 gear.

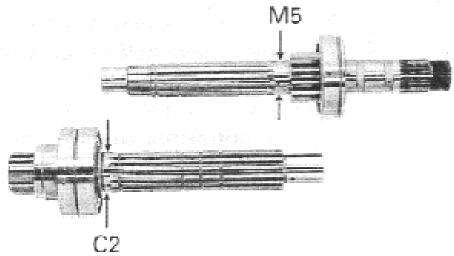
SERVICE LIMIT: 24.96 mm (0.983 in)

Measure the countershaft O.D. at the C2 gear.

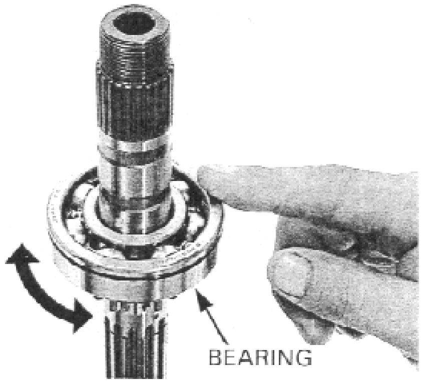
SERVICE LIMIT: 27.96 mm (1.101 in)

Calculate the gear bushing-to-shaft clearance.

SERVICE LIMITS:
M5: 0.06 mm (0.002 in)
C2: 0.06 mm (0.002 in)

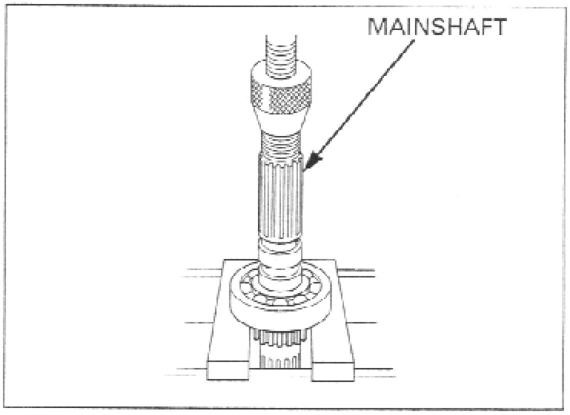


Turn the outer race of each bearing with your finger. The bearings should turn smoothly and quietly.
Also check that the bearing inner race fits tightly on the shaft.
Remove and discard the mainshaft bearing if the race does not turn smoothly, quietly, or fits loosely on the mainshaft.
Replace the countershaft, collar, and bearing as an assembly if the race does not turn smoothly, quietly, or fits loosely on the countershaft.



MAINSHAFT BEARING REPLACEMENT

Press out the mainshaft from the bearing using a hydraulic press.

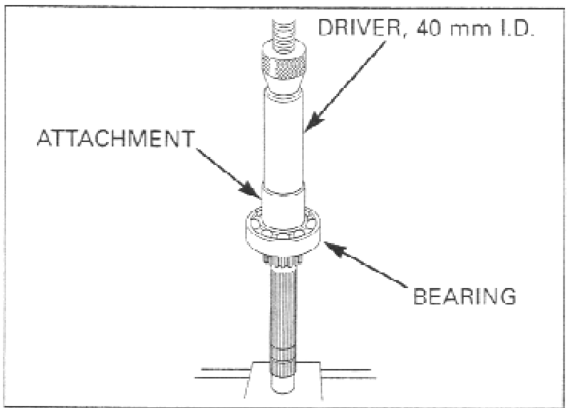


Install with the groove side facing up.

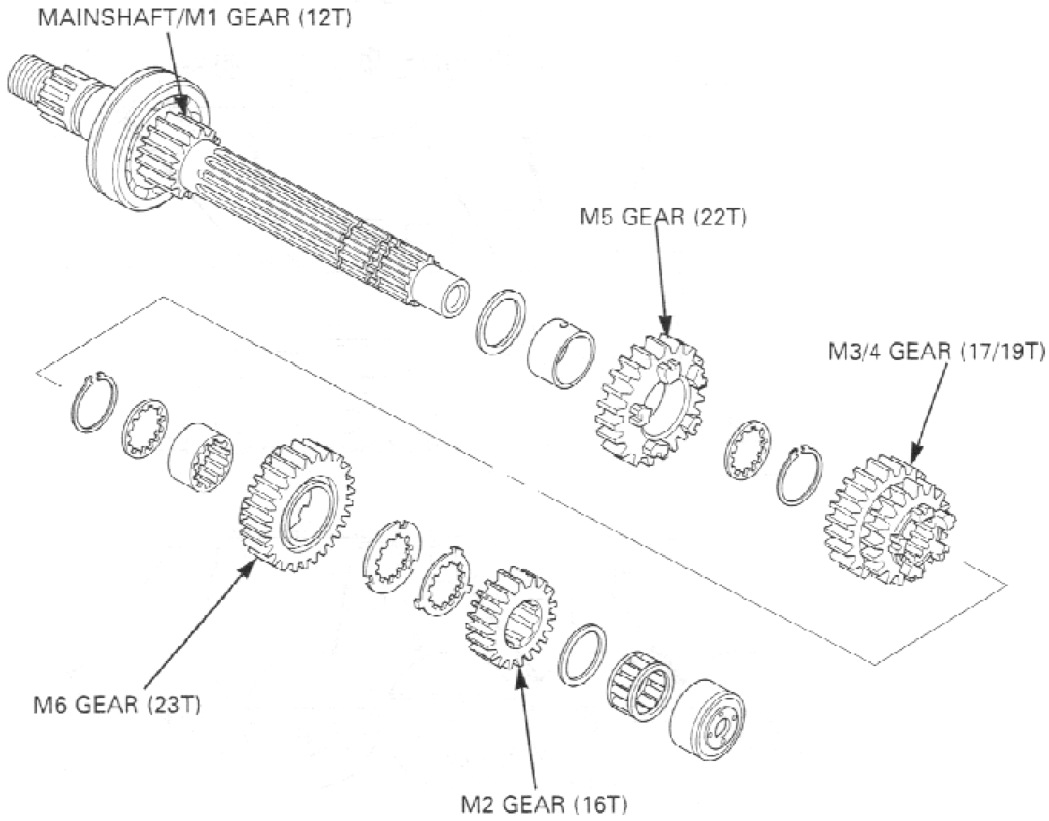
Install a new mainshaft bearing onto the mainshaft by pressing the mainshaft bearing inner race using the special tools.

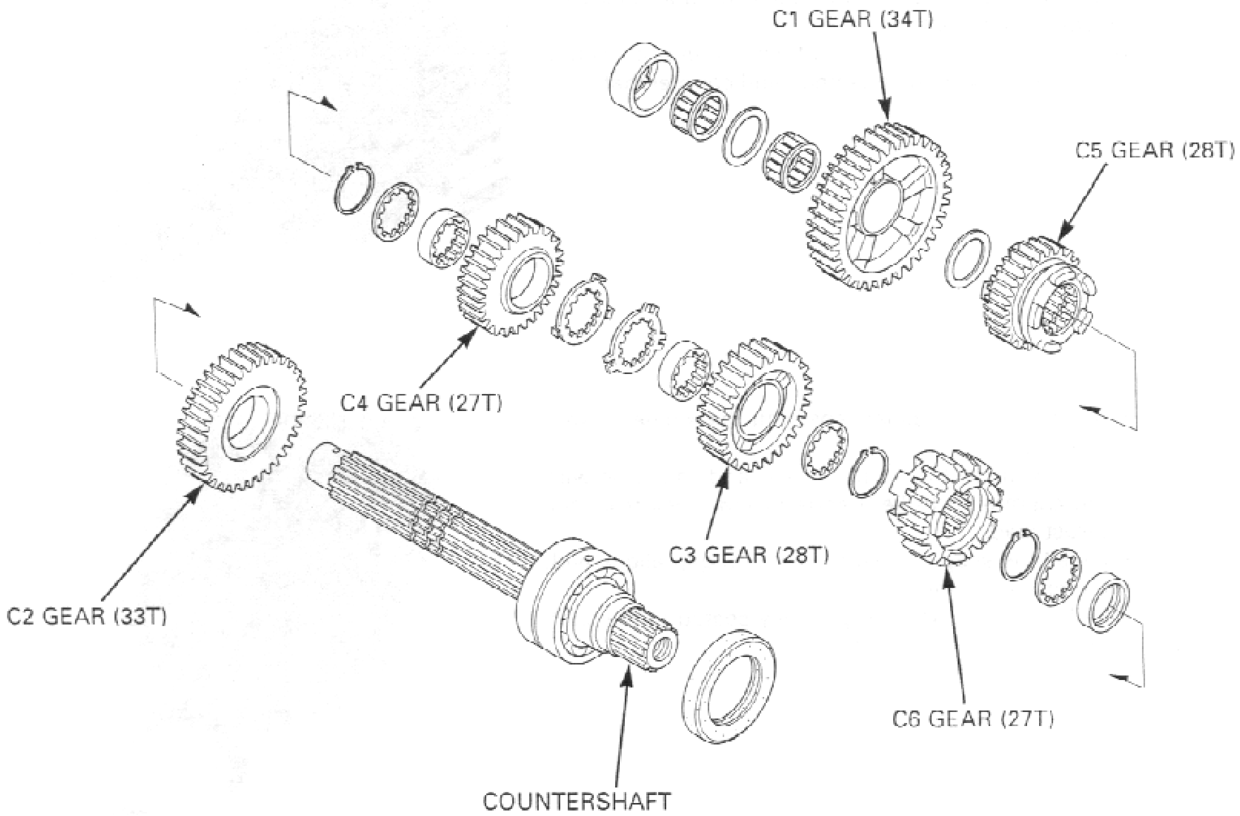
TOOLS:

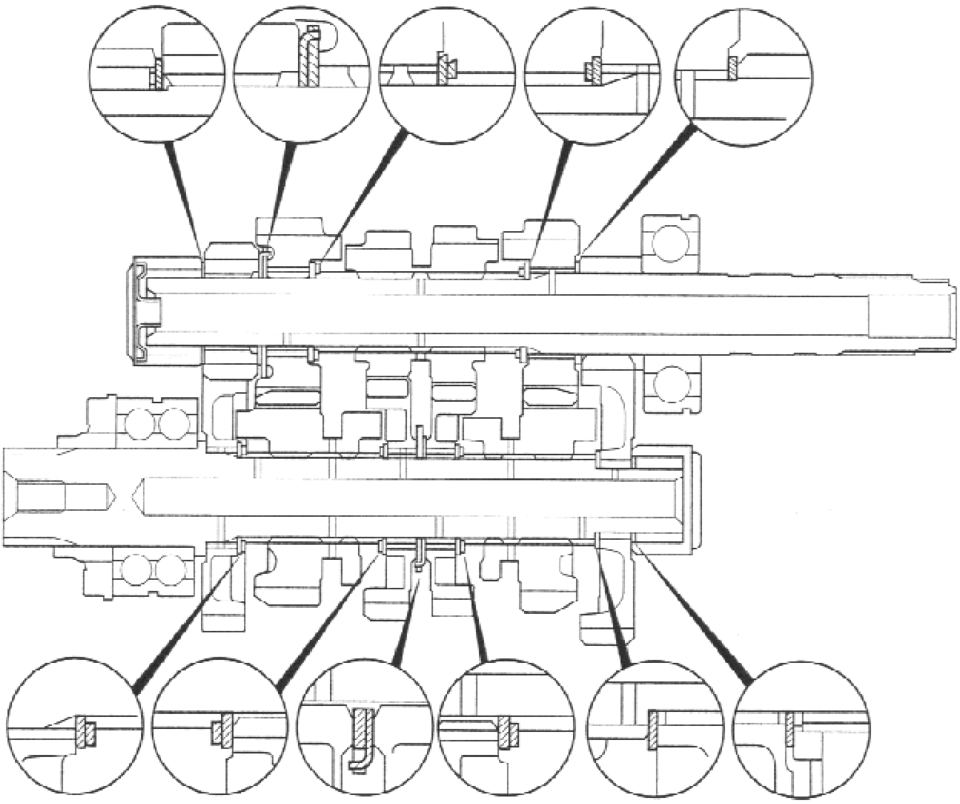
Inner driver C	**07746–0030100**
Attachment, 25 mm I.D.	**07746–0030200**



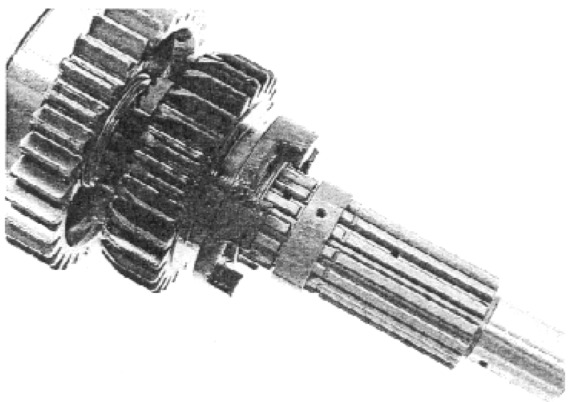
ASSEMBLY


MAINSHAFT/M1 GEAR (12T)
M5 GEAR (22T)
M3/4 GEAR (17/19T)
M6 GEAR (23T)
M2 GEAR (16T)

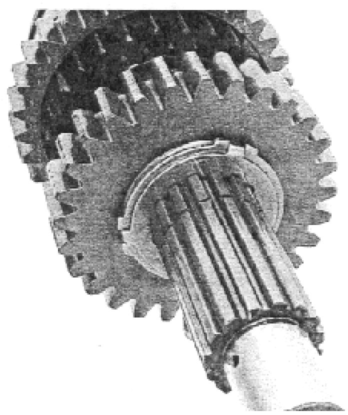

C1 GEAR (34T)
C5 GEAR (28T)
C4 GEAR (27T)
C3 GEAR (28T)
C2 GEAR (33T)
C6 GEAR (27T)
COUNTERSHAFT



Assemble the transmission gear and shafts.
Coat each gear with clean engine oil and check for smooth movement.
Align the oil holes in the M6 bushing and mainshaft, and the C3, C4 spline bushings and countershaft.

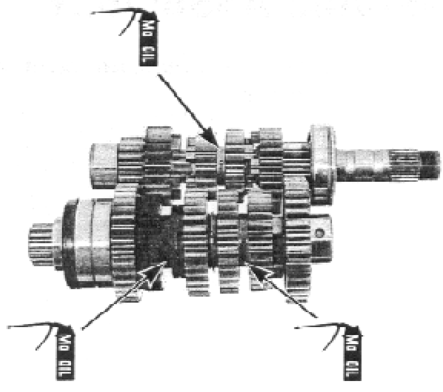


- Align the lock washer tabs with the spline washer grooves.
- Always install the thrust washer and snap ring with the chamfered (rolled) edge facing away from the thrust load.
- Install the snap ring so that its end gap aligns with the groove in the splines.
- Make sure the snap ring is fully seated in the shaft groove after installing it.

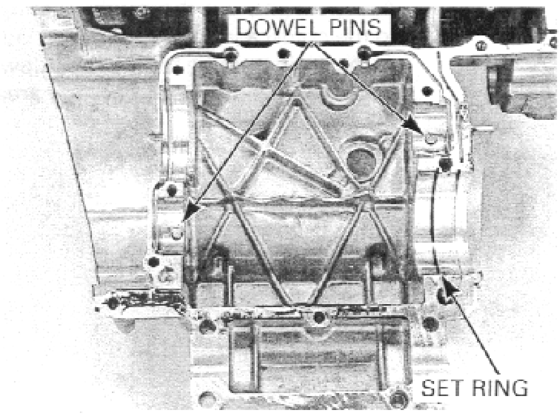


INSTALLATION

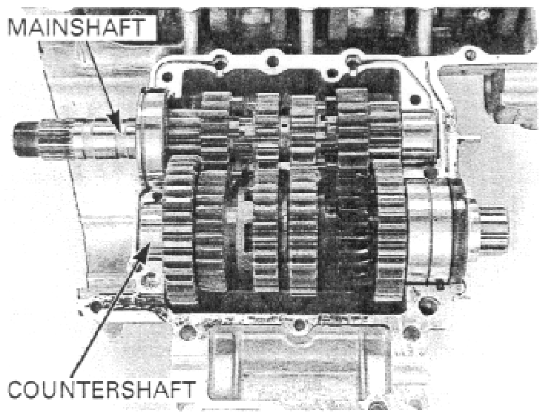
Apply molybdenum oil solution to the shift fork grooves in the M3/4, C5 and C6 gear.



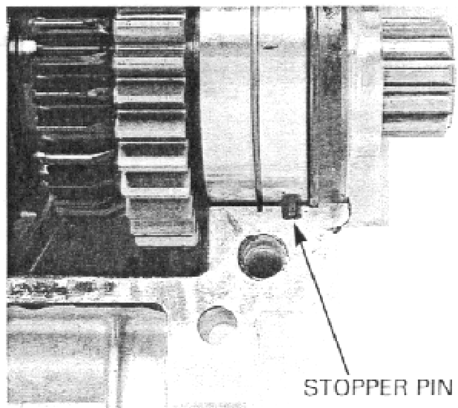
Install the dowel pins in the upper crankcase holes.
Install the countershaft bearing set ring into the upper crankcase groove.



Install the mainshaft and countershaft by aligning the countershaft bearing groove with the set ring on the crankcase, and align the bearing cap holes with the dowel pins.

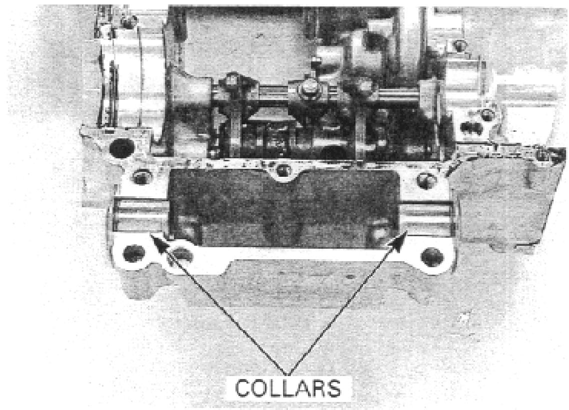


Align the countershaft bearing stopper pin with the groove in the crankcase.

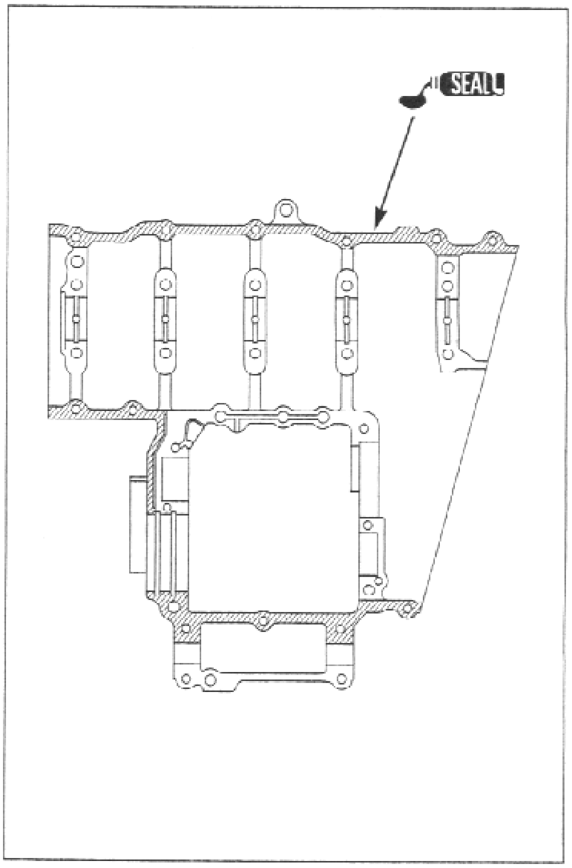


CRANKCASE ASSEMBLY

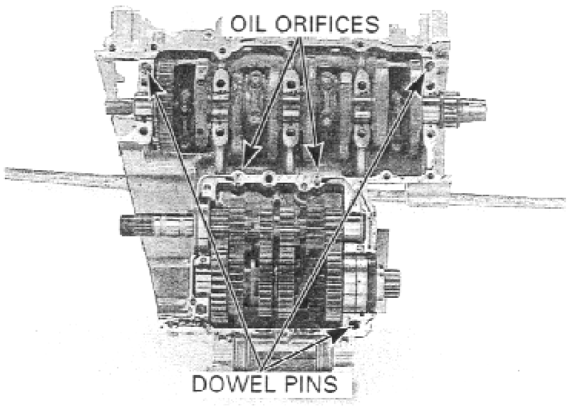
Install the swingarm pivot collars into the lower crankcase.



Apply a light, but thorough, coating of liquid sealant to the crankcase mating surface. Do not apply sealant to the main bearing journal bolt (lower crankcase bolt, 8 mm) area and the oil passage area as shown.



Install the three dowel pins.
Install oil orifices aligning their cut-outs with the groove in the upper crankcase.



Install the lower crankcase onto the upper crankcase.
Clean the new crankcase 8-mm bolts thoroughly with solvent and blow them dry.
Apply oil to the 8-mm bolt threads and seating surface, and install them.
Install the 10-mm bolt, six 7-mm bolts and two 6-mm bolts.

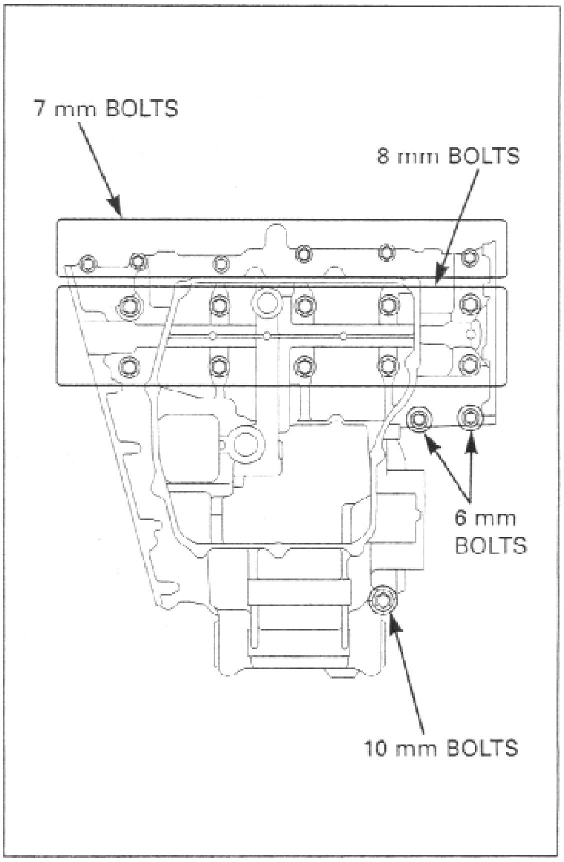
Make sure the upper and lower crankcases are seated securely.

From the inside to outside, tighten the lower crankcase 8-mm bolts (main journal bolts) in a crisscross pattern in two or three steps.

TORQUE: 25 N•m (2.6 kgf•m, 19 lbf•ft)

Tighten the 10-mm bolt to the specified torque, and then tighten 7-mm bolts and 6-mm bolts.

TORQUE: 10-mm bolt: 39 N•m (4.0 kgf•m, 29 lbf•ft)
7-mm bolt: 18 N•m (1.8 kgf•m, 13 lbf•ft)



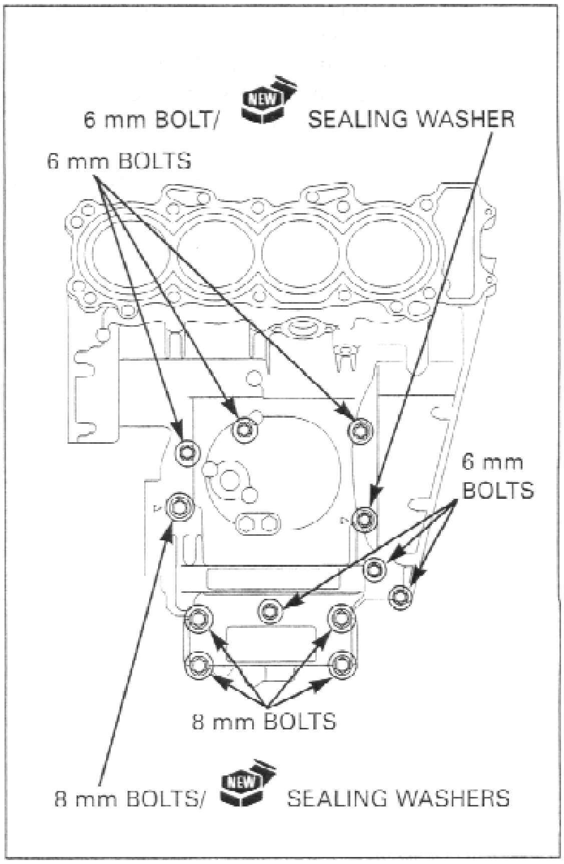
The sealing washer locations are indicated on the upper crankcase using the "Δ" mark.

Install the upper crankcase five 8-mm bolts and seven 6 mm bolts with new sealing washers.

Tighten the 8-mm bolts in a crisscross pattern in two or three steps.

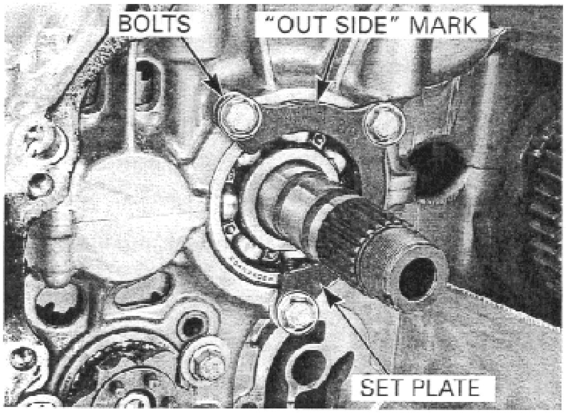
TORQUE: 25 N•m (2.5 kgf•m, 18 lbf•ft)

Tighten the 6-mm bolts in a crisscross pattern in two or three steps securely.



Apply a locking agent to the set plate bolt threads.
Install the mainshaft bearing set plate with its "OUT SIDE" mark facing.
Install and tighten the bolts to the specified torque.

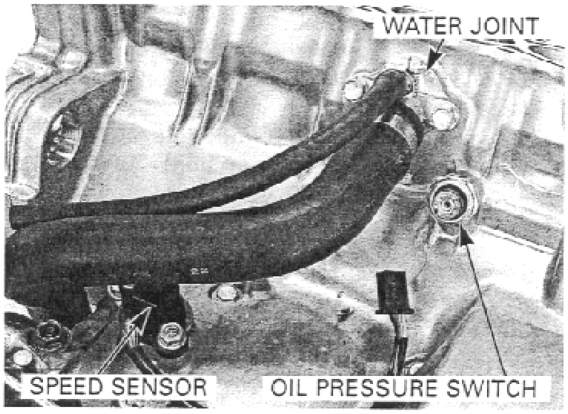
TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)



Install a new O-ring into the groove in the water hose joint groove.
Install the water hose joint to the cylinder block.

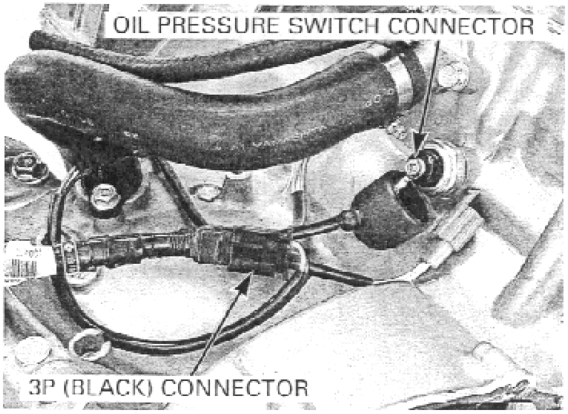
Install and tighten the water hose joint bolts securely.

Install the oil pressure switch (page 19-16).
Install the speed sensor (page 19-12).

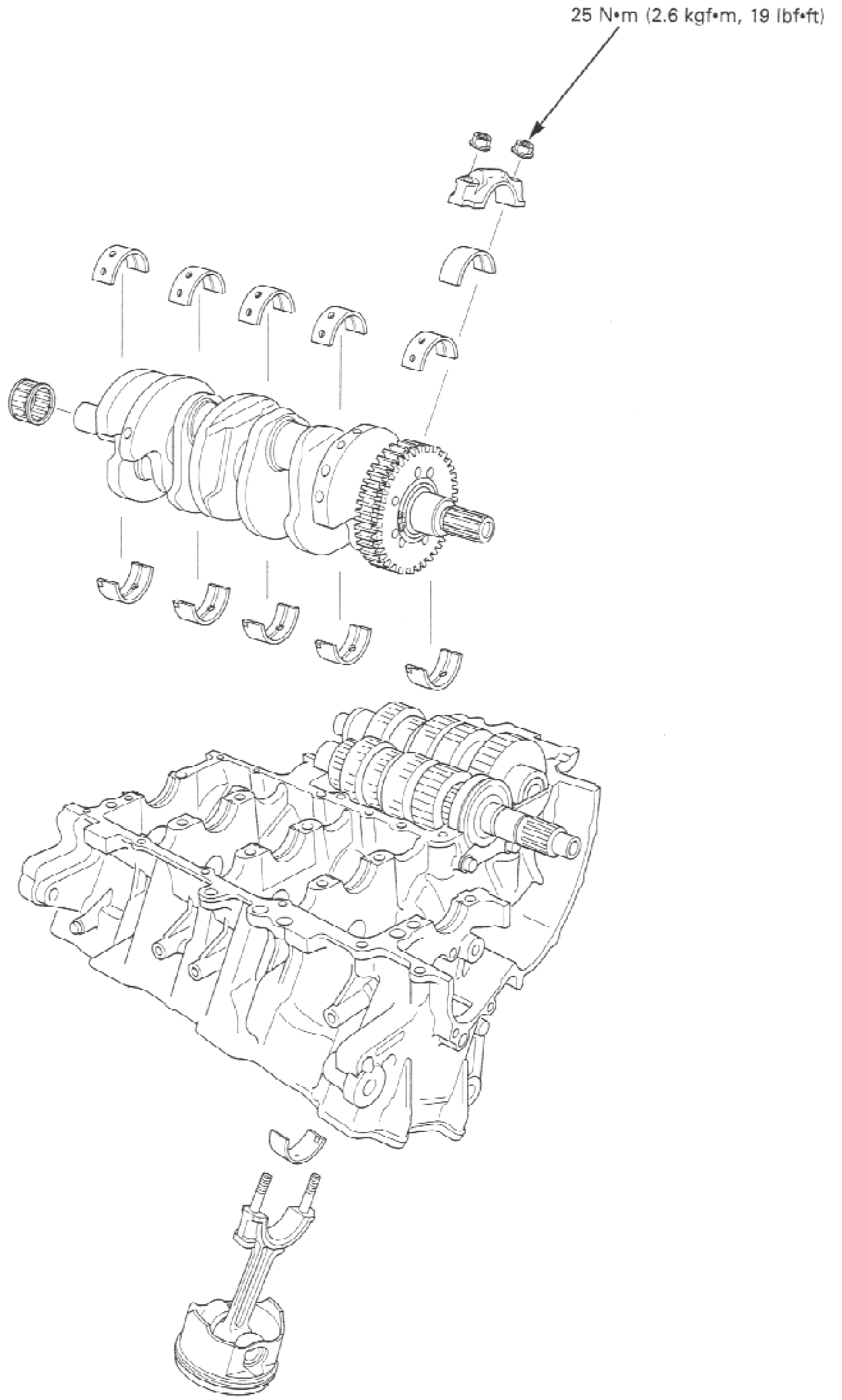


Install the engine sub-harness and connect the following connectors;
- Speed sensor 3P (Black) connector
- Oil pressure switch connector
- Neutral switch connector

Install the removed parts in the reverse order of removal.



MEMO


25 N•m (2.6 kgf•m, 19 lbf•ft)

12. CRANKSHAFT/PISTON/CYLINDER

SERVICE INFORMATION

GENERAL

- The crankcase must be separated to service the crankshaft and piston/connecting rod. Refer to section 11 for crankcase separation and assembly.
- Mark and store the connecting rods, bearing caps, pistons and bearing inserts to be sure of their correct locations during reassembly.
- The crankpin and main journal bearing inserts are select fit and are identified by color codes. Select replacement bearings from the code tables. After selecting new bearings, recheck the oil clearance with plastigauge. Incorrect oil clearance can cause major engine damage.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Crankshaft	Connecting rod side clearance		0.10 – 0.25 (0.004 – 0.010)	0.30 (0.012)
	Crankpin bearing oil clearance		0.028 – 0.052 (0.0011 – 0.0020)	0.06 (0.002)
	Main journal bearing oil clearance		0.020 – 0.038 (0.0008 – 0.0015)	0.05 (0.002)
	Runout		—	0.05 (0.002)
Piston, piston rings	Piston O.D. at 15 mm (0.6 in) from bottom		66.965 – 66.985 (2.6364 – 2.6372)	66.90 (2.634)
	Piston pin bore I.D.		17.002 – 17.008 (0.6694 – 0.6696)	17.02 (0.670)
	Piston pin O.D.		16.994 – 17.000 (0.6691 – 0.6693)	16.98 (0.669)
	Piston-to-piston pin clearance		0.002 – 0.014 (0.0001 – 0.0006)	0.04 (0.002)
	Piston ring end gap	Top	0.10 – 0.20 (0.004 – 0.008)	0.4 (0.02)
		Second	0.18 – 0.30 (0.007 – 0.012)	0.5 (0.02)
		Oil (side rail)	0.2 – 0.7 (0.01 – 0.03)	1.0 (0.04)
	Piston ring-to-ring groove clearance	Top	0.020 – 0.050 (0.0008 – 0.0020)	0.08 (0.003)
		Second	0.015 – 0.050 (0.0006 – 0.0020)	0.08 (0.003)
Cylinder	I.D.		67.000 – 67.015 (2.6378 – 2.6384)	67.10 (2.642)
	Out-of-round		—	0.10 (0.004)
	Taper		—	0.10 (0.004)
	Warpage		—	0.10 (0.004)
Cylinder-to-piston clearance			0.015 – 0.050 (0.0006 – 0.0022)	0.10 (0.004)
Connecting rod small end I.D.			17.016 – 17.034 (0.6699 – 0.6706)	17.04 (0.671)
Connecting rod-to-piston pin clearance			0.016 – 0.040 (0.0006 – 0.0016)	0.06 (0.002)

12

TORQUE VALUES

Connecting rod bearing cap nut	25 N•m (2.6 kgf•m, 19 lbf•ft)	Apply oil to the threads and seating surface.
Crankcase bolt (main journal)	25 N•m (2.6 kgf•m, 19 lbf•ft)	Apply oil to the threads and seating surface.

TOOLS

Inner driver C	07746–0030100	
Attachment, 30 mm I.D.	07746–0030300	
Universal bearing puller	07631–0010000	Equivalent commercially available in U.S.A.

TROUBLESHOOTING

Cylinder compression is too low, hard to start or poor performance at low speed
- Leaking cylinder head gasket
- Worn, stuck or broken piston ring
- Worn or damaged cylinder and piston

Cylinder compression too high, overheats or knocks
- Carbon deposits on the cylinder head and/or piston crown

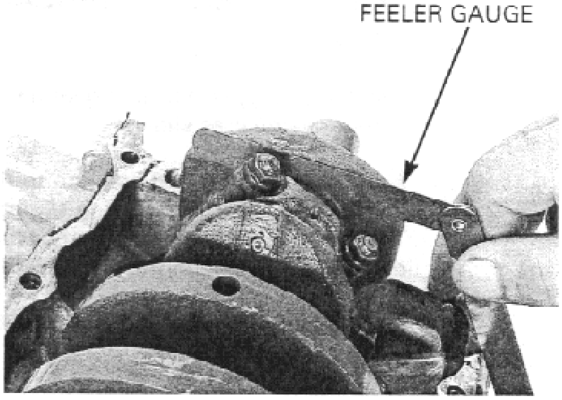
Excessive smoke
- Worn cylinder, piston or piston ring
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

Abnormal noise
- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings
- Worn main journal bearings
- Worn crankpin bearings

Engine vibration
- Excessive crankshaft runout

CRANKSHAFT

Separate the crankcase halves (page 11-3).



SIDE CLEARANCE INSPECTION

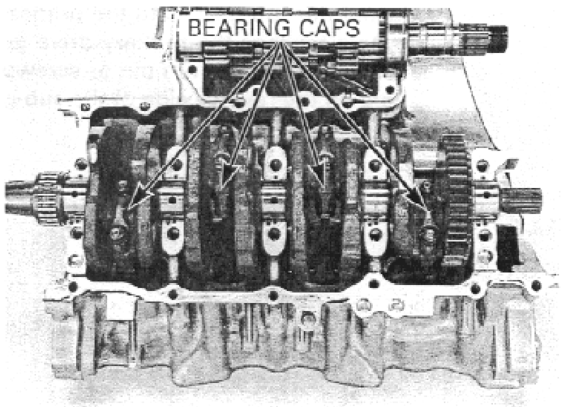
Measure the connecting rod side clearance.

SERVICE LIMIT: 0.30 mm (0.012 in)

If the clearance exceeds the service limit, replace the connecting rod.
Recheck and if still out of limit, replace the crankshaft.

REMOVAL

Be careful not to damage the crankpin, main journal and bearing inserts.

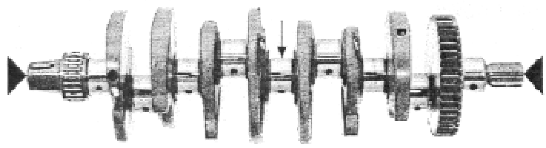


Mark the bearing caps and bearings as you remove them to indicate the correct cylinder for reassembly.

Remove the connecting rod bearing cap nuts and bearing caps.
Tap the side of the cap lightly if the bearing cap is hard to remove.

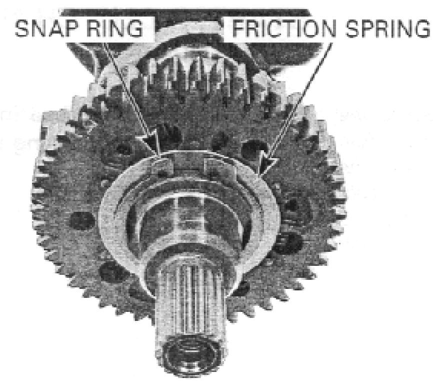
Remove the crankshaft.

INSPECTION



Hold the crankshaft both end.
Set a dial gauge on the center main journal of the crankshaft.
Rotate the crankshaft two revolutions and read the runout.

SERVICE LIMIT: 0.05 mm (0.002 in)



Check the primary drive gear and sub-gear teeth for abnormal wear or damage.

PRIMARY DRIVE SUB-GEAR REMOVAL

Remove the special snap ring and friction spring.

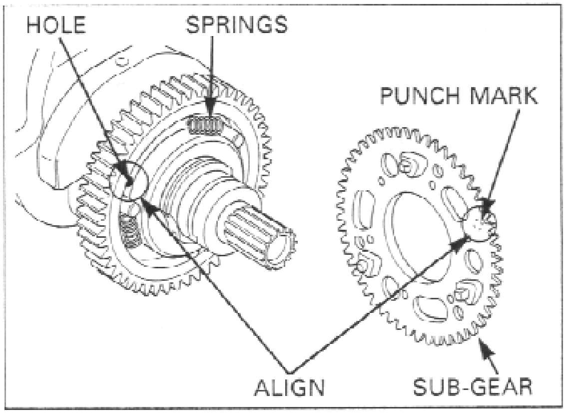
Remove the primary drive sub-gear, gear springs and stopper pins.

PRIMARY DRIVE SUB-GEAR INSTALLATION

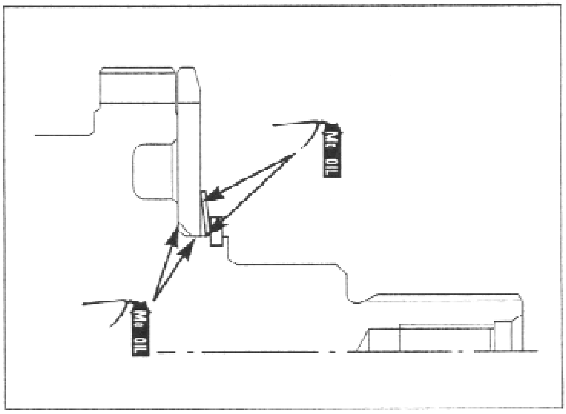
Install the stopper pins and gear springs onto the primary drive gear as shown.

Apply molybdenum oil solution to the sub-gear sliding surface and friction spring sliding surface.
Temporarily install the sub-gear by aligning the punch mark with the hole in the primary drive gear.

Install the friction spring onto the sub-gear.

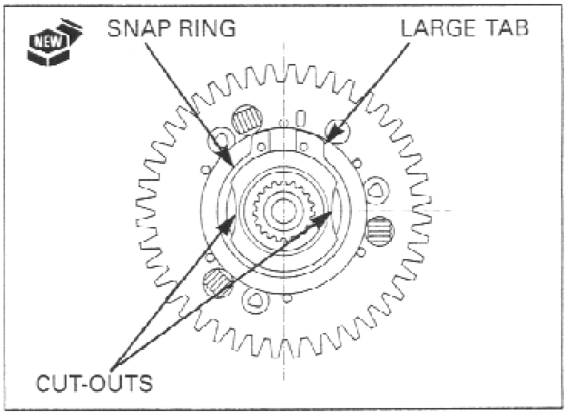


Install the sub-gear onto the primary drive gear so it evenly touches the primary drive gear by prying the sub-gear with a 5-mm pin or screwdriver is the stoppers on the reverse side of the sub-gear push against the gear springs.



Install with the large tab facing the right and the chamfered side facing the gear.

Install a new snap ring into the ring groove in the crankshaft securely with the end gap at a right angle to the crankshaft cut-outs. Be sure to align the large tab edge with the sub-gear groove as shown.



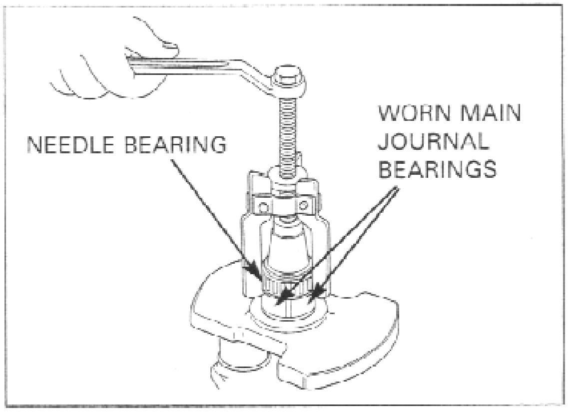
STARTER CLUTCH NEEDLE BEARING REPLACEMENT

To protect the crankshaft main journal from the bearing puller claws, cover the mainshaft journal properly. You can use worn main journal bearings for protectors.

Remove the needle bearing with a commercially available universal bearing puller.

TOOL:

Universal bearing puller	**07631–0010000 (equivalent commercially available in U.S.A.)**

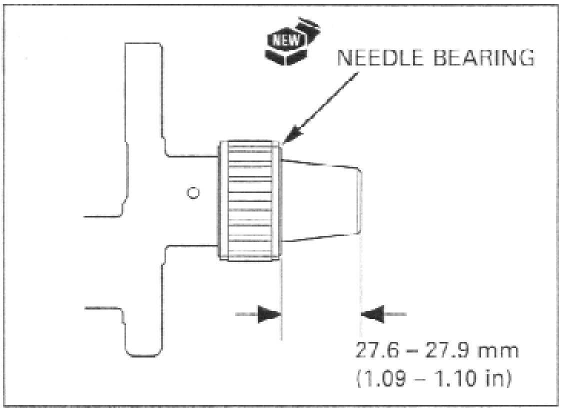


Press with the marked side facing up.

Press a new needle bearing onto the crankshaft using a hydraulic press and special tools until its edge is flush with the groove in the crankshaft.
Make sure that the height from the crankshaft end is 27.6 – 27.9 mm (1.09 – 1.10 in).

TOOLS:

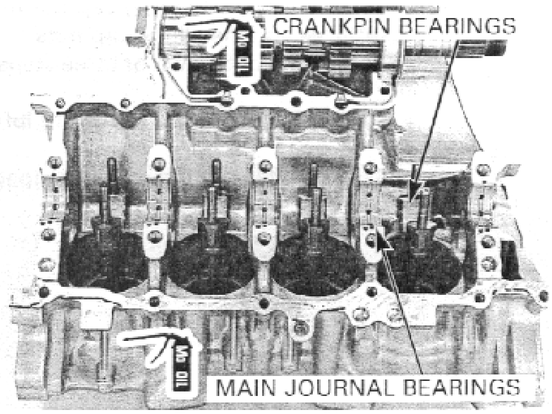
Inner driver C	**07746–0030100**
Attachment, 30 mm I.D.	**07746–0030300**



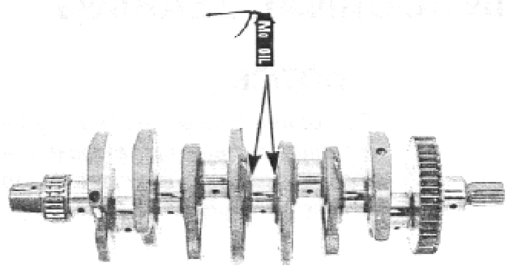
INSTALLATION

Do not get the molybdenum oil solution onto the connecting rod bolts and bearing cap nuts. The oil may prevent the cap nuts from being tightened to the correct torque.

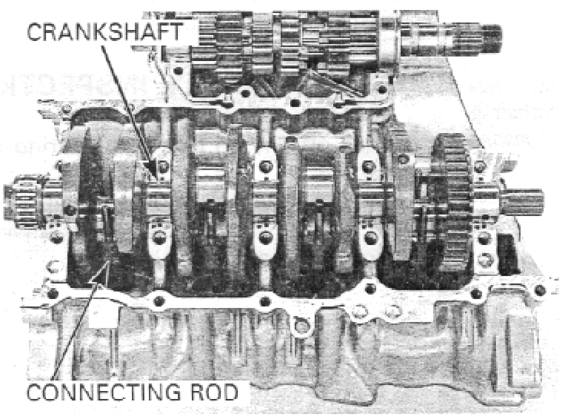
Apply molybdenum oil solution to the main journal bearing sliding surfaces on the upper crankcase and the crankpin bearing sliding surfaces on the connecting rods.



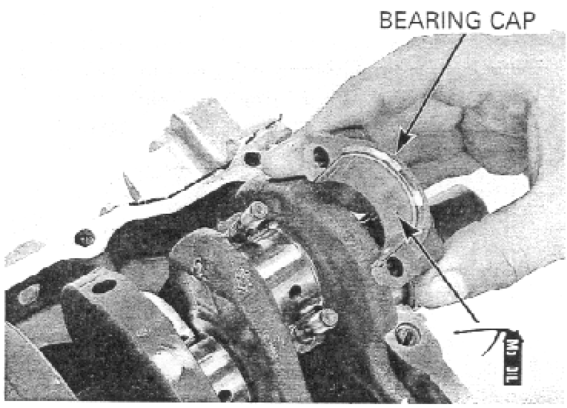
Apply molybdenum oil solution to the thrust surfaces of the crankshaft as shown.



Lower all of the pistons to top dead center to avoid damaging the crankpin with the connecting rod bolts.
Carefully install the crankshaft onto the upper crankcase.
Set the connecting rods onto the crankpins.



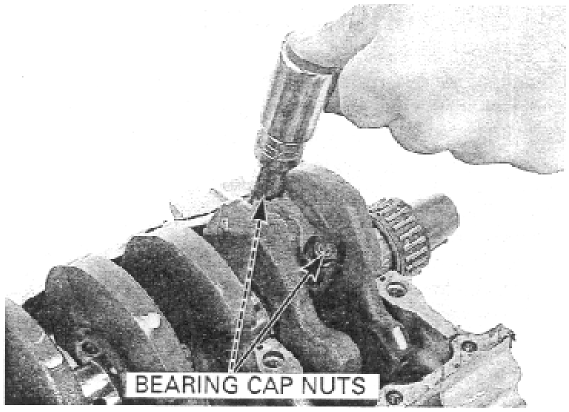
Apply molybdenum oil solution to the crankpin bearing sliding surfaces on the bearing caps.
Install the bearing caps by aligning the I.D. code on the connecting rod and bearing cap.
Be sure each part is installed in its original position, as noted during removal.



Apply oil to the bearing cap nut threads and seating surfaces and install the cap nuts.
Tighten the nut in two or three steps and torque them.

TORQUE: 25 N•m (2.6 kgf•m, 19 lbf•ft)

Assemble the crankcase halves (page 11-12).

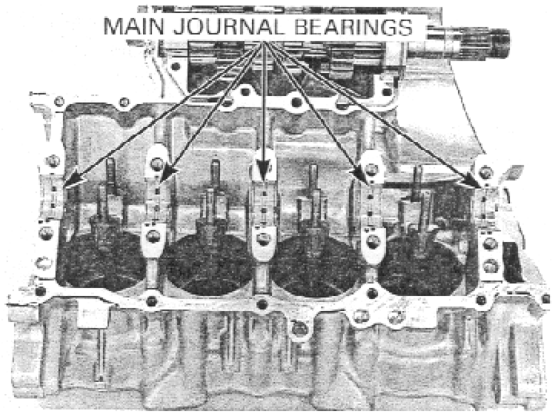


MAIN JOURNAL BEARING

NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

Remove the crankshaft (page 12-3).



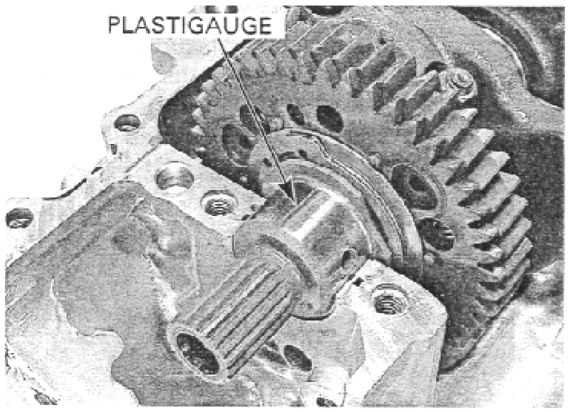
BEARING INSPECTION

Inspect the main journal bearing inserts on the upper and lower crankcase for unusual wear or peeling.
Check the bearing tabs for damage.

OIL CLEARANCE INSPECTION

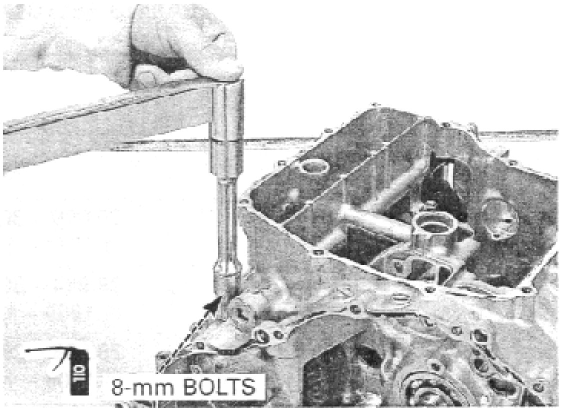
Do not rotate the crankshaft during inspection.

Clean off any oil from the bearing inserts and main journals.
Install the crankshaft onto the upper crankcase.
Put a strip of plastigauge lengthwise on each main journal and avoid the oil hole.



Install the dowel pins and oil orifices.
Carefully install the lower crankcase on the upper crankcase.
Apply engine oil onto the main journal 8-mm bolt threads and seating surfaces and install them.
Tighten the 8-mm bolts in a crisscross pattern in two or three steps.

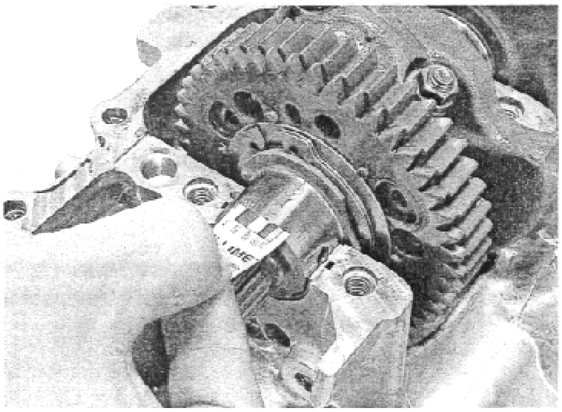
TORQUE: 25 N·m (2.6 kgf·m, 19 lbf·ft)



Remove the 8-mm bolts and lower crankcase.
Measure the compressed plastigauge at its widest point on each main journal to determine the oil clearance.

SERVICE LIMITS: 0.05 mm (0.002 in)

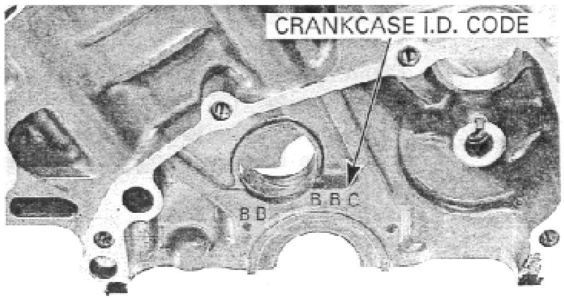
If main bearing clearance exceeds the service limit, select the correct replacement bearings.



BEARING SELECTION

Letters (A, B or C) on the left side of upper crankcase are the codes for the bearing support I.D.s from left to right.

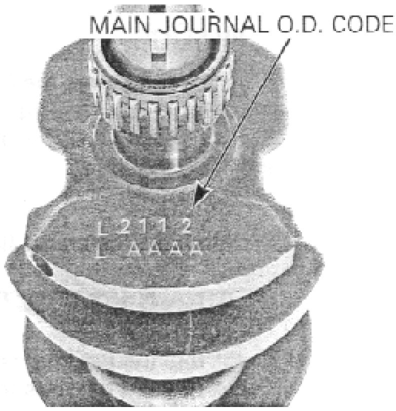
Record the crankcase bearing support I.D. code letters from the left side of the upper crankcase as shown.



Numbers (1, 2 or 3) on the crank weight are the codes for the main journal O.D.s from left to right.

Record the corresponding main journal O.D. code numbers from the crank weight.

Cross reference the main journal and bearing support codes to determine the replacement bearing color code.

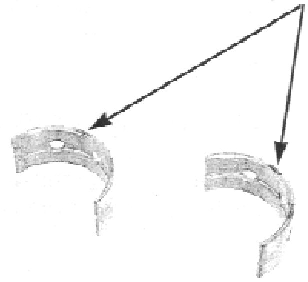


MAIN JOURNAL BEARING SELECTION TABLE:

Unit: mm (in)

			BEARING SUPPORT I.D. CODE		
			A	B	C
			33.000 – 33.006 (1.2992 – 1.2994)	33.006 – 33.012 (1.2994 – 1.2997)	33.012 – 33.018 (1.2997 – 1.2999)
MAIN JOURNAL O.D. CODE	1	30.000 – 30.006 (1.1811 – 1.1813)	E (Pink)	D (Yellow)	C (Green)
	2	29.994 – 30.000 (1.1809 – 1.1811)	D (Yellow)	C (Green)	B (Brown)
	3	29.988 – 29.994 (1.1806 – 1.1809)	C (Green)	B (Brown)	A (Black)

BEARING THICKNESS:
- A (Black) Thick
- B (Brown):
- C (Green):
- D (Yellow):
- E (Pink) Thin

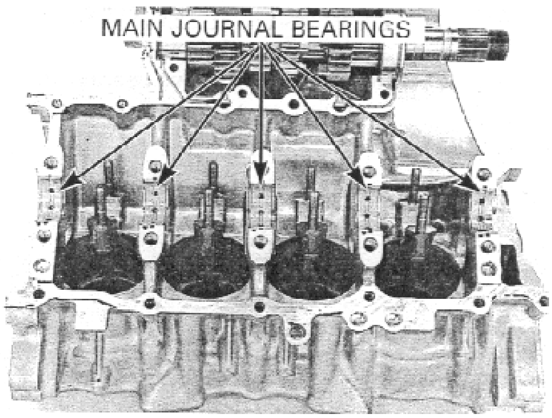


NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces and crankcase bearing supports.
Install the main journal bearing inserts onto the crankcase bearing supports, aligning each tab with each groove.



CRANKPIN BEARING

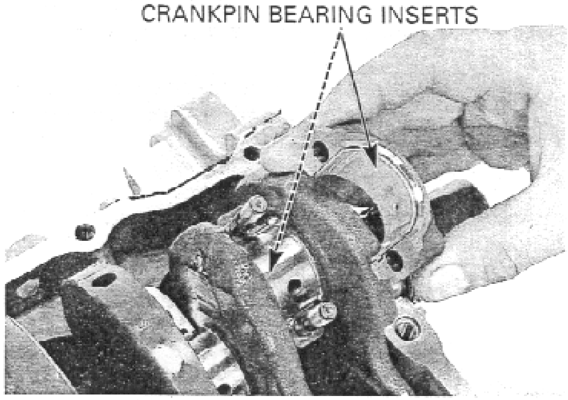
NOTICE

Do not interchange the bearing inserts. They must be installed in their original locations or the correct bearing oil clearance may not be obtained, resulting in engine damage.

Remove the crankshaft (page 12-3).

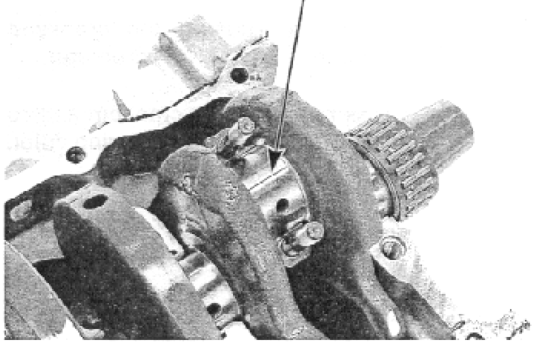
BEARING INSPECTION

Check the bearing inserts for unusual wear or peeling.
Check the bearing tabs for damage.



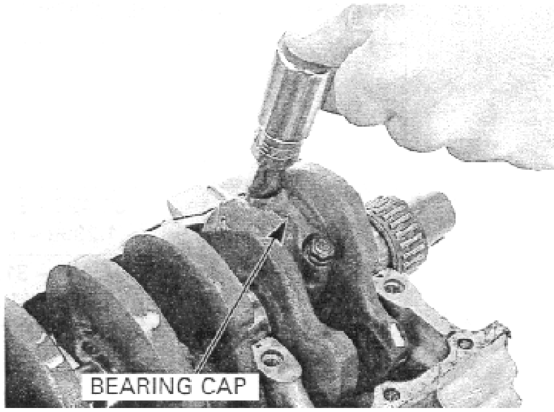
OIL CLEARANCE INSPECTION

Clean off any oil from the bearing inserts and crankpin.
Carefully install the crankshaft onto the upper crankcase.
Set the connecting rods onto the crankpin.
Put a strip of plastigauge lengthwise on the crankpin and avoid the oil hole.



Carefully install the bearing caps by aligning the I.D. code.
Apply engine oil to the connecting rod bearing cap nut threads and seating surfaces and install them.
Tighten the cap nuts in two or three steps.

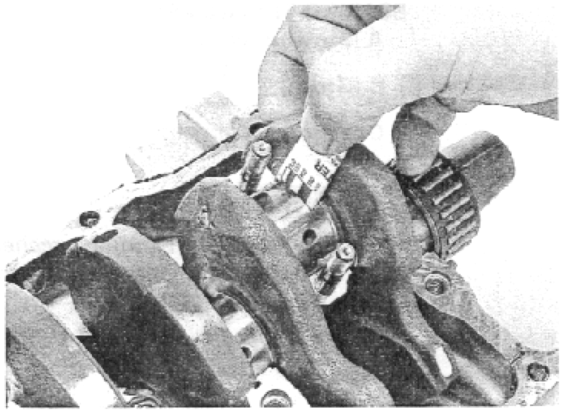
TORQUE: 25 N·m (2.6 kgf·m, 19 lbf·ft)



Remove the nuts and bearing cap.
Measure the compressed plastigauge at its widest point on the crankpin to determine the oil clearance.

SERVICE LIMIT: 0.06 mm (0.002 in)

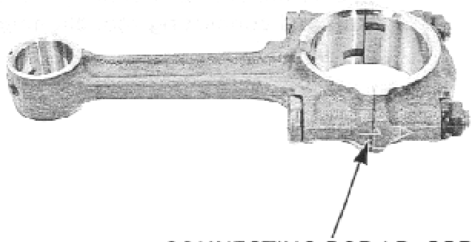
If the oil clearance exceeds the service limit, select the correct replacement bearings.



BEARING SELECTION

Numbers (1 or 2) on the connecting rods are the codes for the connecting rod I.D.

Record the connecting rod I.D. code number (1 or 2) or measure the I.D. with the bearing cap installed without bearing inserts.

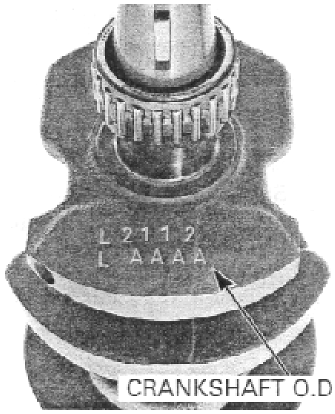


Letters (A or B) on the crank weight are the codes for the crankpin O.D.s from left to right.

If you are replacing the crankshaft, record the corresponding crankpin O.D. code number (A or B).

If you are reusing the crankshaft, measure the crankpin O.D. with a micrometer.

Cross-reference the crankpin and rod codes to determine the replacement bearing color.

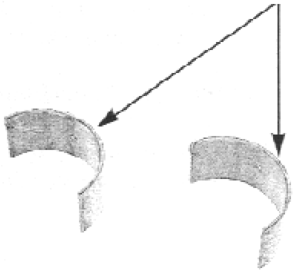


CRANKPIN BEARING SELECTION TABLE:

Unit: mm (in)

			CONNECTING ROD I.D. CODE	
			1	2
			34.000 – 34.008 (1.3386 – 1.3389)	34.008 – 34.016 (1.3389 – 1.3392)
CRANK PIN O.D. CODE	A	31.492 – 31.500 (1.2398 – 1.2402)	C (Yellow)	B (Green)
	B	31.484 – 31.492 (1.2395 – 1.2398)	B (Green)	A (Brown)

BEARING THICKNESS:
A (Brown): Thick
B (Green):
C (Yellow): Thin

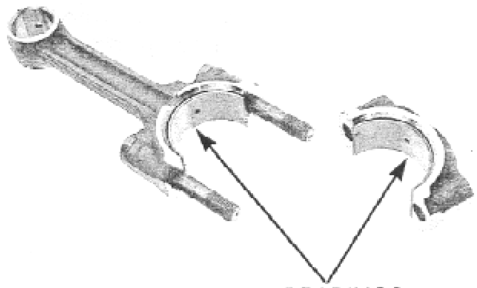


NOTICE

After selecting new bearings, recheck the clearance with a plastigauge. Incorrect clearance can cause severe engine damage.

BEARING INSTALLATION

Clean the bearing outer surfaces, bearing cap and connecting rod.
Install the crankpin bearing inserts onto the bearing cap and connecting rod, aligning each tab with each groove.

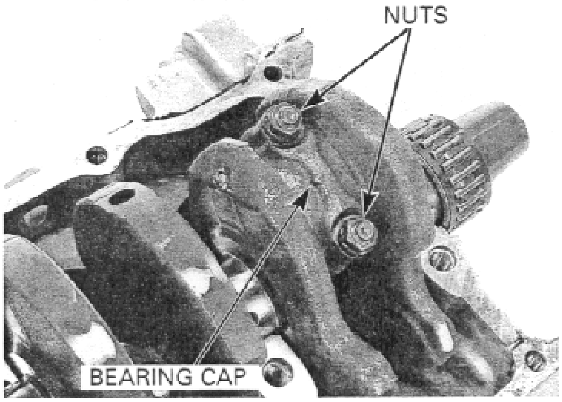


PISTON/CYLINDER

PISTON/CONNECTING ROD REMOVAL

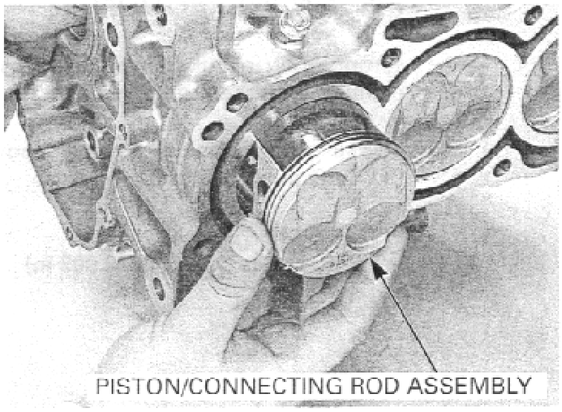
Mark all the parts as you remove them to indicate the correct cylinder for reassembly.

Remove the nuts and connecting rod bearing cap.



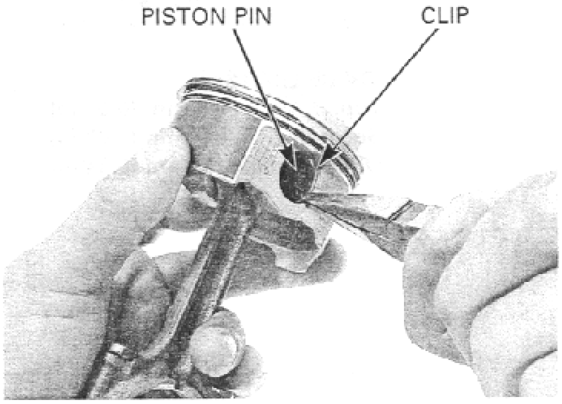
Do not try to remove the connecting rod/piston assembly from the bottom of the cylinder; the assembly will be locked so that the oil ring expands in the gap between the cylinder liner and the upper crankcase.

Remove the piston/connecting rod assembly from the top of the cylinder.



PISTON REMOVAL

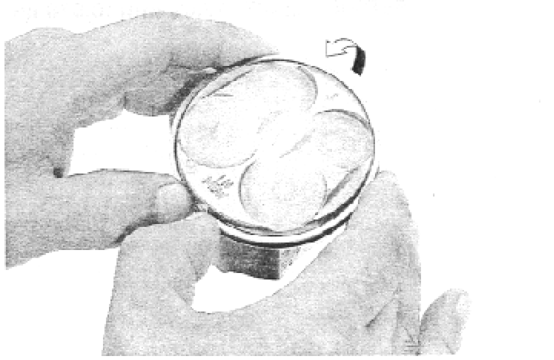
Remove the piston pin clip with pliers.
Push the piston pin from the piston and connecting rod, and remove the piston.



PISTON DISASSEMBLY

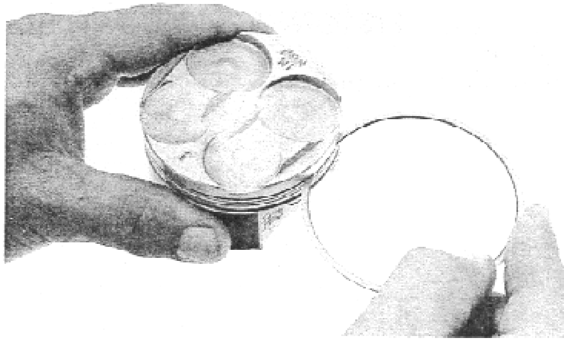
Do not damage the piston ring by spreading the ends too far.

Spread each piston ring and remove it by lifting up at a point opposite the gap.



Clean carbon deposits from the ring grooves with an old piston ring. Never use a wire brush; it will scratch the groove.

Remove any carbon deposits from the piston ring grooves.

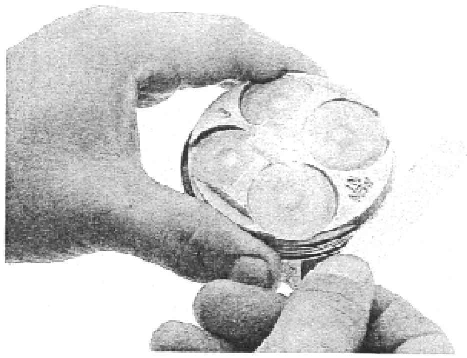


PISTON INSPECTION

Temporarily install the piston rings to their proper position with the mark facing up.

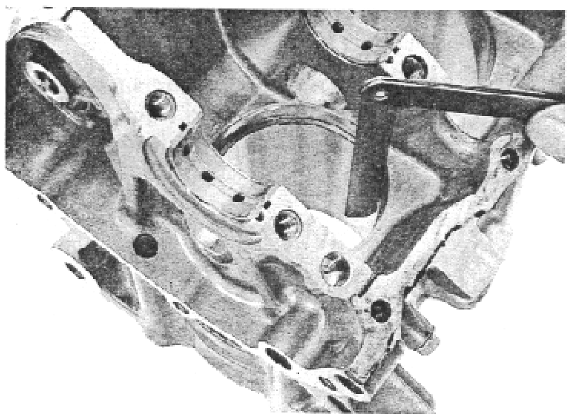
Measure the piston ring-to-ring groove clearance with the rings pushed into the grooves.

SERVICE LIMITS:
Top/second: 0.08 mm (0.003 in)



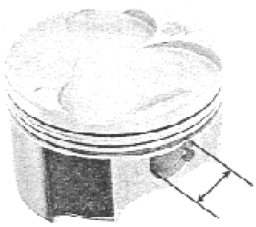
Insert the piston ring squarely into the bottom of the cylinder and measure the ring end gap.

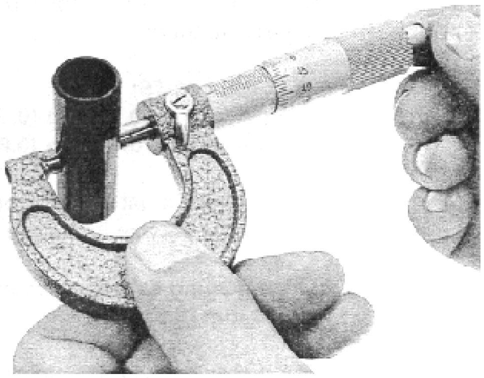
SERVICE LIMITS:
Top: 0.4 mm (0.02 in)
Second: 0.5 mm (0.02 in)
Oil (side rail): 1.0 mm (0.04 in)



Measure the piston pin bore.

SERVICE LIMIT: 17.02 mm (0.670 in)





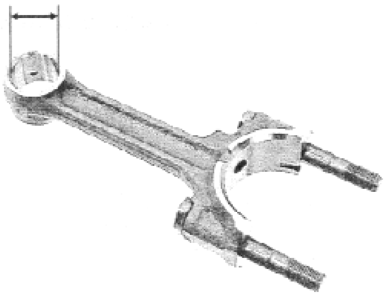
Measure the O.D. of the piston pin.

SERVICE LIMIT: 16.98 mm (0.669 in)

Calculate the piston-to-piston pin clearance.

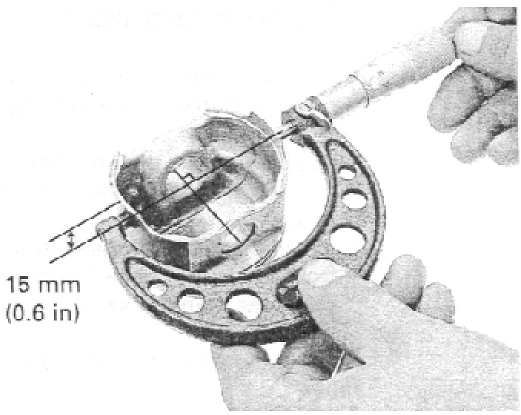
SERVICE LIMIT: 0.04 mm (0.002 in)

CONNECTING ROD INSPECTION



Measure the connecting rod small end I.D.

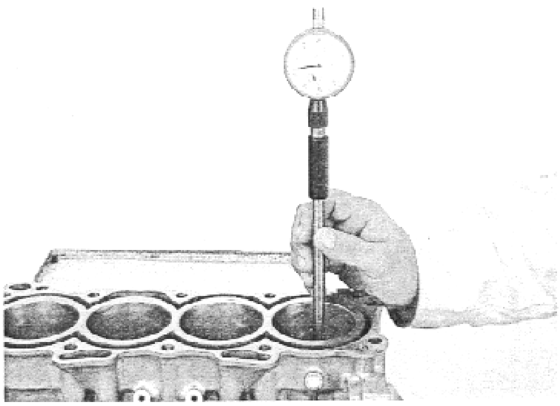
SERVICE LIMIT: 17.04 mm (0.671 in)



Measure the diameter of the piston at 15 mm (0.6 in) from the bottom and 90 degrees to the piston pin hole.

SERVICE LIMIT: 66.90 mm (2.634 in)

CYLINDER INSPECTION



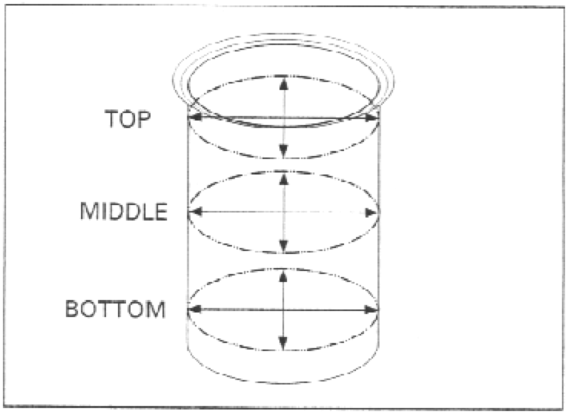
Inspect the cylinder bore for wear or damage.
Measure the cylinder I.D. in the X and Y axes at three levels.
Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 67.10 mm (2.642 in)

Calculate the piston-to-cylinder clearance.
Take a maximum reading to determine the clearance.
Refer to page 11-5 for measurement of the piston O.D.

SERVICE LIMIT: 0.10 mm (0.004 in)

Calculate the taper and out-of-round at three levels in the X and Y axes. Take the maximum reading to determine them.



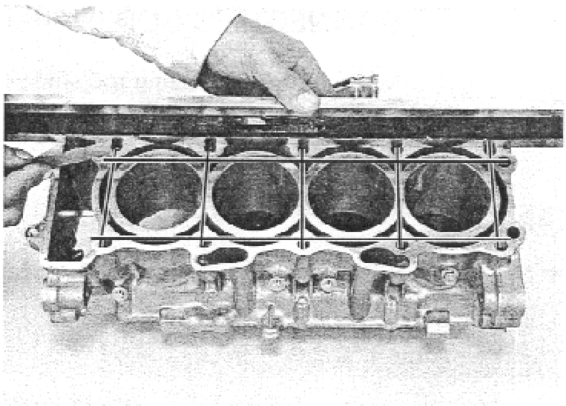
SERVICE LIMITS:
Taper: 0.10 mm (0.004 in)
Out of round: 0.10 mm (0.004 in)

The cylinder must be rebored and an oversize piston fitted if the service limits are exceeded.

The following oversize piston is available:
0.25 mm (0.010 in)

The piston to cylinder clearance for the oversize piston must be: 0.015 – 0.050 mm (0.0006 – 0.0020 in).

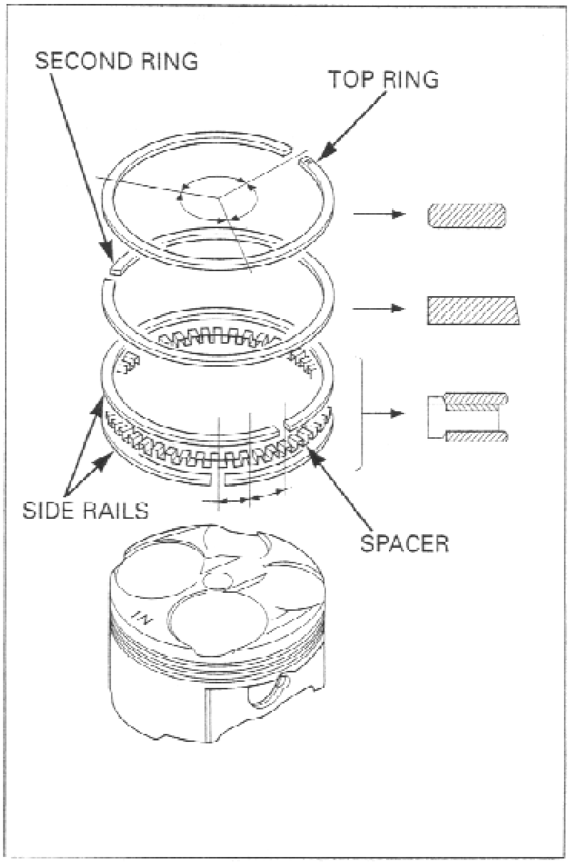
Inspect the top of the cylinder for warpage.



SERVICE LIMIT: 0.10 mm (0.004 in)

PISTON ASSEMBLY

Carefully install the piston rings into the piston ring grooves with their marks facing up.



- Apply oil to the piston rings.
- Avoid piston and piston ring damage during installation.
- Install the piston rings with the marks facing up.
- Do not mix the top and second rings; the top ring is narrower than the second ring in width.

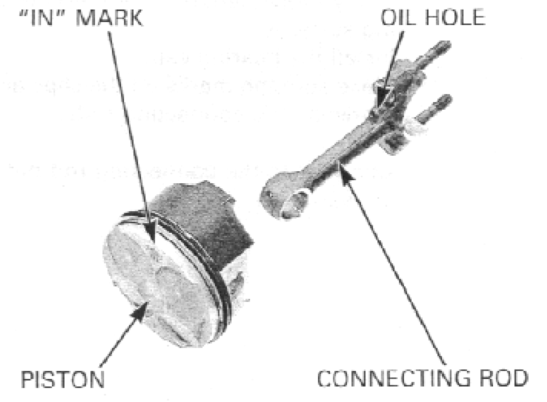
Stagger the piston ring end gaps 120° apart from each other.
Stagger the side rail end gaps as shown.

PISTON INSTALLATION

Apply molybdenum oil solution to the connecting rod small end inner surfaces and piston pin outer surfaces.

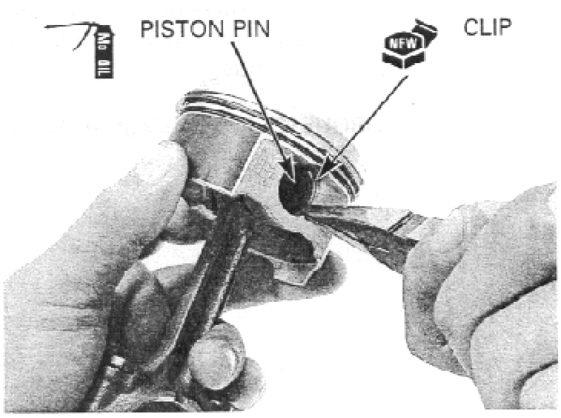
Install the piston so the "IN" mark faces the same direction as the oil hole in the connecting rod.

Install the piston pin into the piston and connecting rod.



Install new piston pin clips are into the grooves of the piston pin hole.

- Make sure that the piston pin clips seated securely.
- Do not align the piston pin clip end gap with the piston cut-out.



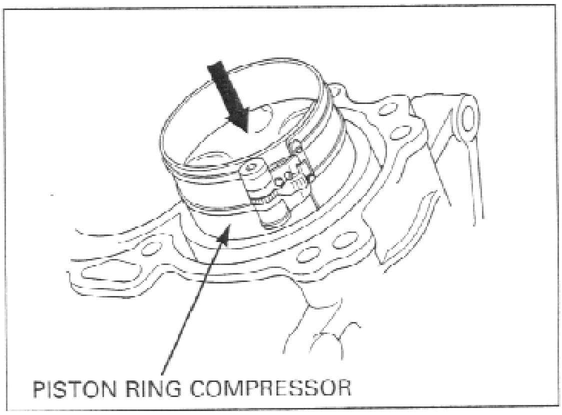
Apply engine oil to the cylinder wall, piston and piston rings.

Install the piston/connecting rod assembly with the piston "IN" mark facing to the intake side.

Install the piston/connecting rod assembly into the cylinder using a commercially available piston ring compressor tool.

NOTICE

- *While installing the piston, being careful not to damage the top surface of the cylinder, especially around the cylinder bore.*
- *Be careful not to damage the cylinder sleeve and crankpin with the connecting rod bolt threads.*

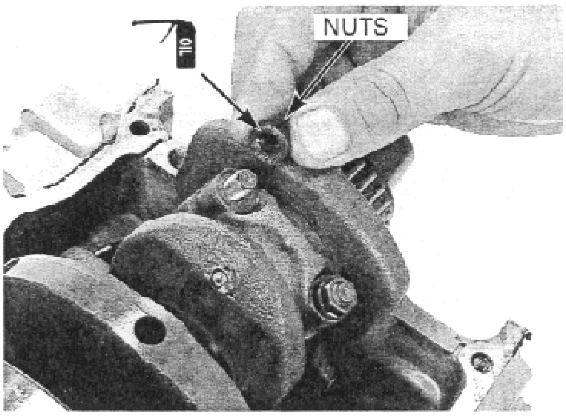


Make sure the ring compressor tool sits flush with the top surface of the cylinder.

Use the handle of a plastic hammer to tap the piston into the cylinder.

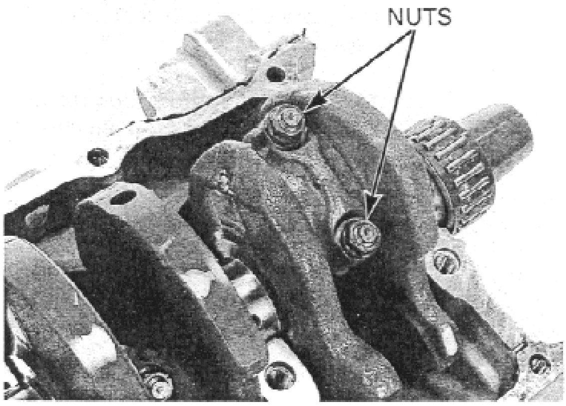
Apply molybdenum oil solution to the crankpin bearing surfaces.
Install the bearing cap.
Make sure the marks on the caps are aligned with the marks on the connecting rods.

Apply oil to the connecting rod nut threads and seating surfaces.

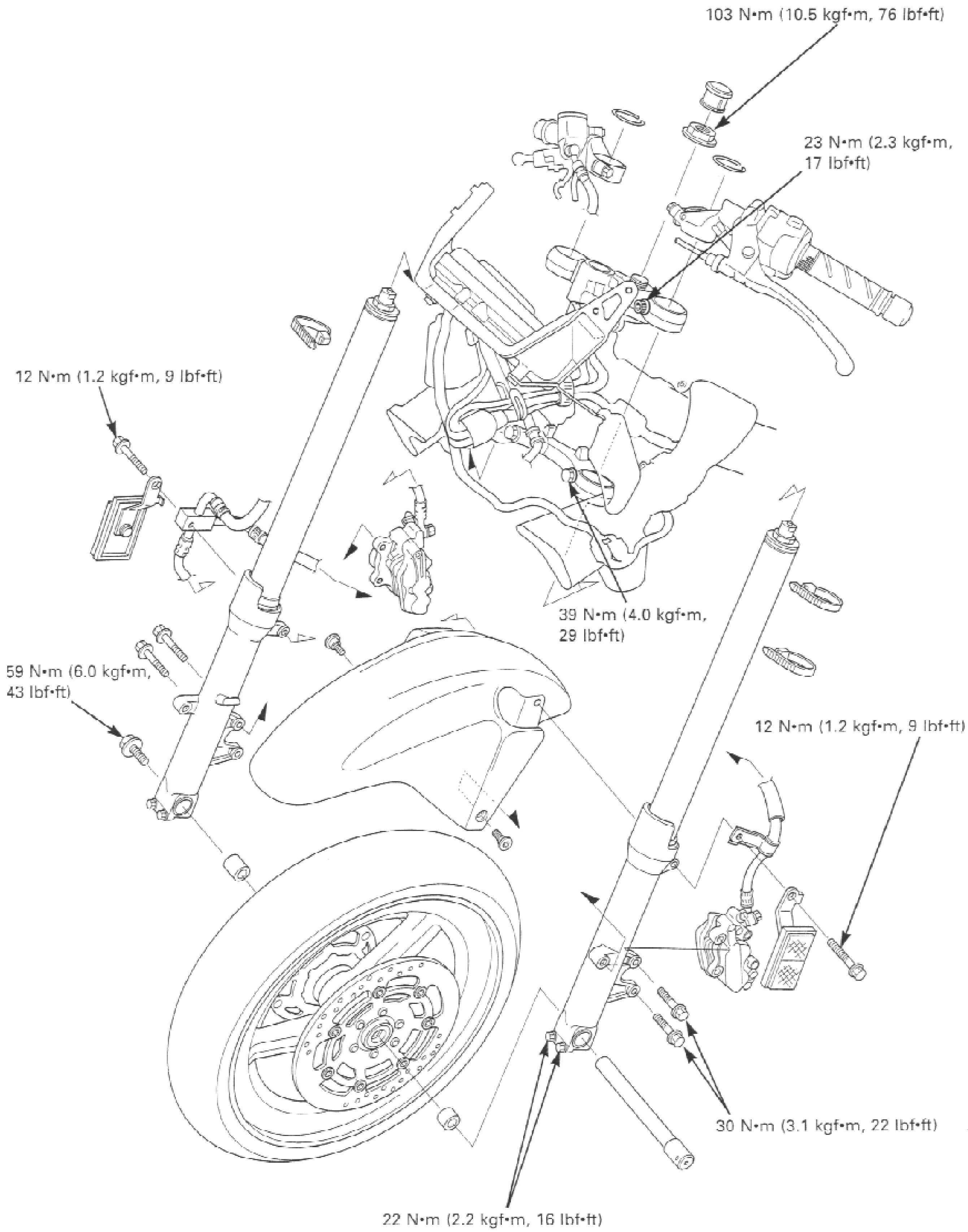


Install the connecting rod nuts and tighten the nuts gradually and alternately, then tighten them to the specified torque.

TORQUE: 25 N·m (2.6 kgf·m, 19 lbf·ft)



MEMO


103 N•m (10.5 kgf•m, 76 lbf•ft)
23 N•m (2.3 kgf•m, 17 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)
39 N•m (4.0 kgf•m, 29 lbf•ft)
59 N•m (6.0 kgf•m, 43 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)
30 N•m (3.1 kgf•m, 22 lbf•ft)
22 N•m (2.2 kgf•m, 16 lbf•ft)

13. FRONT WHEEL/SUSPENSION/STEERING

SERVICE INFORMATION

GENERAL

- When servicing the front wheel, fork or steering stem, support the motorcycle using a safety stand or hoist.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After front wheel installation, check the brake operation by applying the brake lever.
- Refer to section 15 for brake system information.
- Use only tires marked "TUBELESS" and tubeless valves on rim marked "TUBELESS TIRE APPLICABLE".

SPECIFICATIONS

Unit: mm (in)

ITEM		STANDARD	SERVICE LIMIT
Minimum tire tread depth		—	1.5 (0.06)
Cold tire pressure	Up to 90 kg (200 lb) load	250 kPa (2.50 kgf/cm², 36 psi)	—
	Up to maximum weight capacity	250 kPa (2.50 kgf/cm², 36 psi)	—
Axle runout		—	0.2 (0.01)
Wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Wheel balance weight		—	60 g (2.1 oz) max.
Fork	Spring free length	286 (11.3)	280.3 (11.03)
	Tube runout	—	0.20 (0.008)
	Recommended fork fluid	Pro Honda Suspension Fluid SS-8	—
	Fluid level	116 (4.6)	—
	Fluid capacity	462 ± 2.5 cm³ (15.6 ± 0.08 US oz, 16.3 ± 0.09 Imp oz)	—
	Pre-load adjuster initial setting	4th groove from top	—
	Rebound adjuster initial setting	1-3/4 turns out from full hard	—
	Compression adjuster initial setting	1-1/4 turns out from full hard	—
Steering head bearing pre-load		1.0 – 1.5 kgf (2.2 – 3.3 lbf)	—

TORQUE VALUES

Handlebar weight mounting screw	10 N•m (1.0 kgf•m, 7 lbf•ft)	ALOC screw; replace with a new one.
Front brake disc bolt	20 N•m (2.0 kgf•m, 14 lbf•ft)	ALOC bolt; replace with a new one.
Front axle bolt	59 N•m (6.0 kgf•m, 43 lbf•ft)	
Front axle holder flange bolt	22 N•m (2.2 kgf•m, 16 lbf•ft)	
Front brake hose clamp flange bolt (left fork)	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Front brake hose 3-way joint bolt (right fork)	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Fork socket bolt	34 N•m (3.5 kgf•m, 25 lbf•ft)	Apply a locking agent to the threads.
Fork bolt	23 N•m (2.3 kgf•m, 17 lbf•ft)	
Fork top bridge pinch socket bolt	23 N•m (2.3 kgf•m, 17 lbf•ft)	
Fork bottom bridge pinch flange bolt	39 N•m (4.0 kgf•m, 29 lbf•ft)	
Steering bearing adjustment nut	25 N•m (2.5 kgf•m, 18 lbf•ft)	Apply oil to the threads and seating surface.
Steering bearing adjustment nut lock nut	—	Apply oil to the threads and seating surface.
Steering stem nut	103 N•m (10.5 kgf•m, 76 lbf•ft)	Apply oil to the threads and seating surface. See page 13-29.
Front brake hose clamp bolt (steering stem)	10 N•m (1.0 kgf•m, 7 lbf•ft)	
Front master cylinder mounting bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Front brake caliper mounting bolt	30 N•m (3.1 kgf•m, 22 lbf•ft)	ALOC bolt; replace with a new one.

TOOLS

Bearing remover shaft	07746–0050100
Bearing remover head, 20 mm	07746–0050600
Driver	07749–0010000
Attachment, 42 x 47 mm	07746–0010300
Pilot, 20 mm	07746–0040500
Fork seal driver weight	07947–KA50100
Fork seal driver attachment	07947–KA40200
Steering stem socket	07916–3710101
Ball race remover set	07946–KM90001
– Driver attachment, A	07946–KM90100
– Driver attachment, B	07946–KM90200
– Driver shaft assembly	07946–KM90300
– Bearing remover, A	07946–KM90401
– Bearing remover, B	07946–KM90500
– Assembly base	07946–KM90600
Steering stem driver	07946–MB00000

TROUBLESHOOTING

Hard steering
- Steering head bearing adjustment nut too tight
- Worn or damaged steering head bearings
- Bent steering stem
- Insufficient tire pressure

Steers to one side or does not track straight
- Damaged or loose steering head bearings
- Bent forks
- Bent axle
- Wheel installed incorrectly
- Bent frame
- Worn or damaged wheel bearings
- Worn or damaged swingarm pivot bearings

Front wheel wobbles
- Bent rim
- Worn or damaged front wheel bearings
- Faulty tire
- Unbalanced front tire and wheel

Front heel turns hard
- Faulty front wheel bearing
- Bent front axle
- Front brake drag

Soft suspension
- Insufficient fluid in fork
- Incorrect fork fluid weight
- Weak fork springs
- Insufficient tire pressure

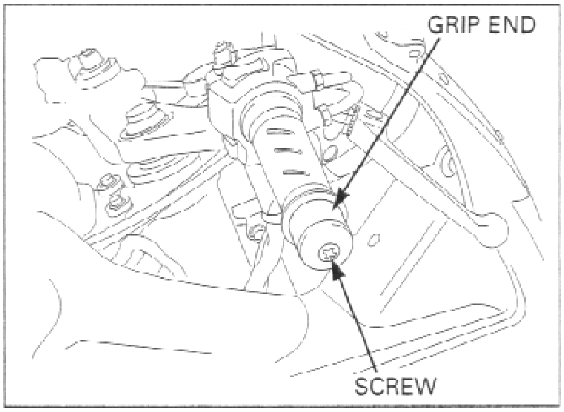
Hard suspension
- Bent fork tubes
- Too much fluid in fork
- Incorrect fork fluid weight
- Clogged fork fluid passage

Front suspension noise
- Insufficient fluid in fork
- Loose fork fasteners

HANDLEBARS

HANDLEBAR REMOVAL

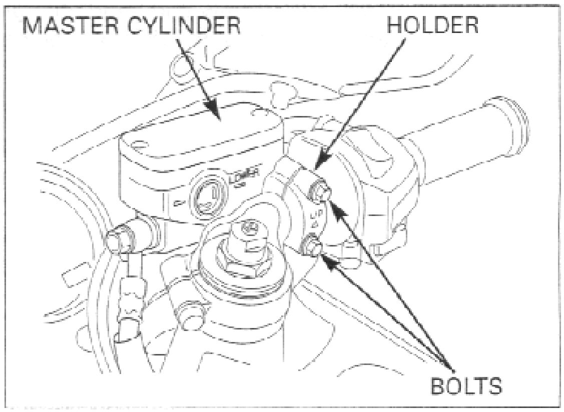
Hold the handlebar weight and remove the mounting screw and the weight.



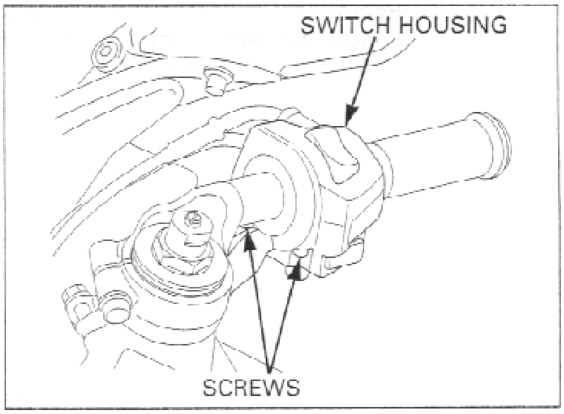
Disconnect the front brake switch wire connectors from the switch.

Keep the brake master cylinder upright to prevent air from entering the hydraulic system.

Remove the master cylinder holder bolts, holder and master cylinder assembly.

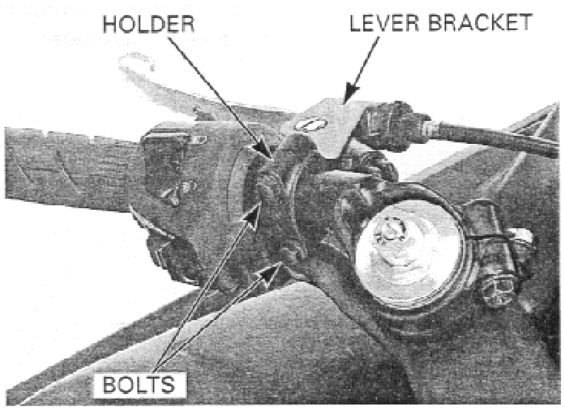


Remove the right handlebar switch/throttle housing screws.

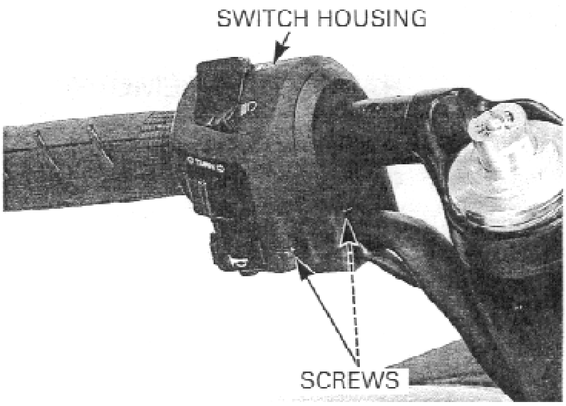


Disconnect the clutch switch wire connectors from the switch.

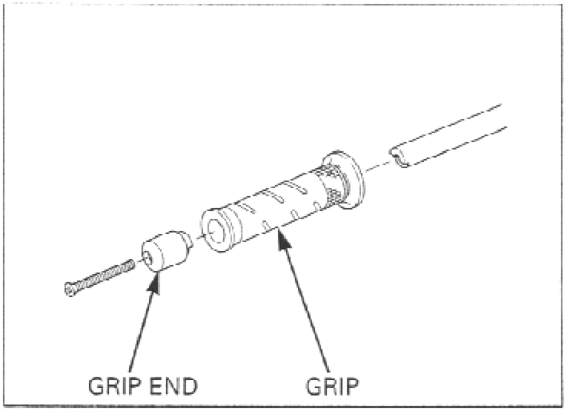
Remove the clutch lever bracket holder bolts, holder and clutch lever bracket assembly.



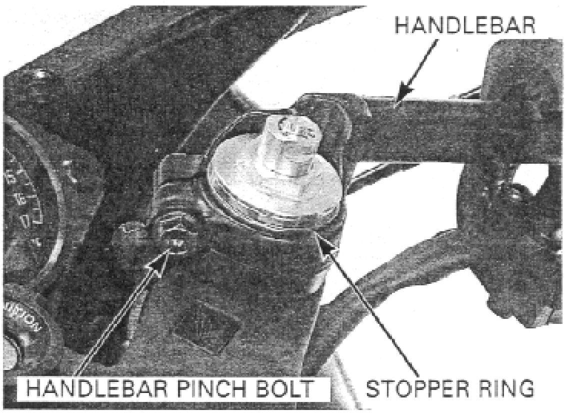
Remove the screws and left handlebar switch housing.



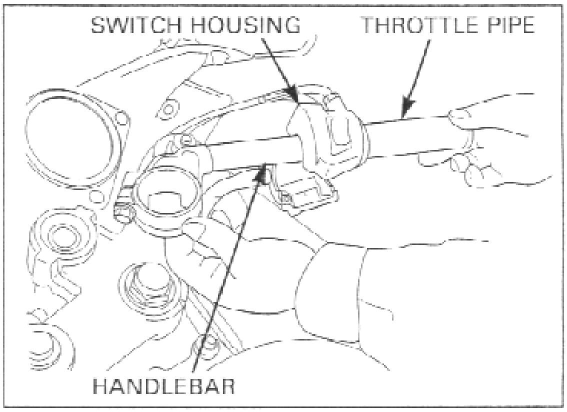
Remove the screw and handlebar grip end.
Remove the handle grip from the handlebar.



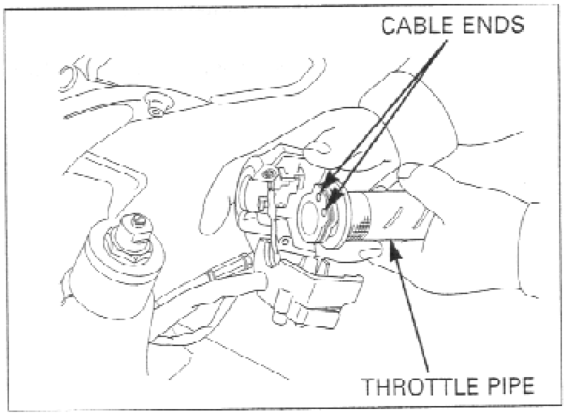
Remove the handlebar stopper ring.
Loosen the handlebar pinch bolt and remove the handlebar from the fork tube.



Remove the right handlebar switch housing and throttle pipe from the right handlebar.

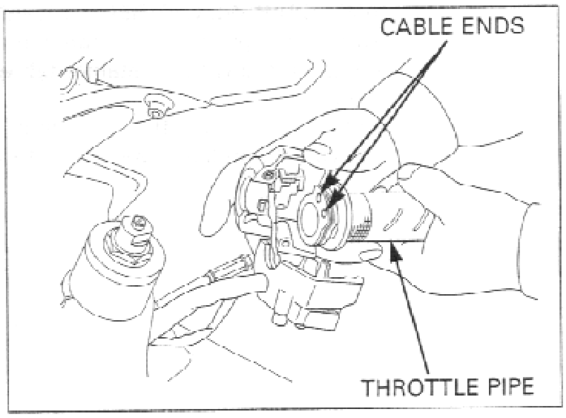


Disconnect the throttle cable ends from the throttle pipe and remove the housing.

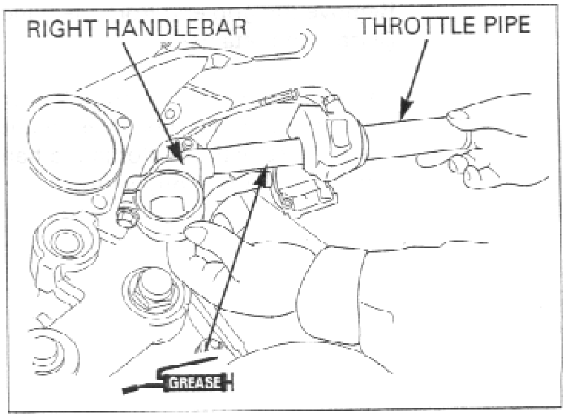


INSTALLATION

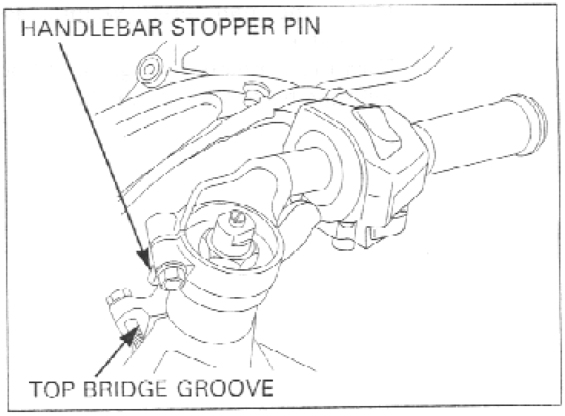
Connect the throttle cable ends to the throttle pipe.



Apply grease to the sliding surface of the throttle pipe.
Install the throttle pipe into the right handlebar.

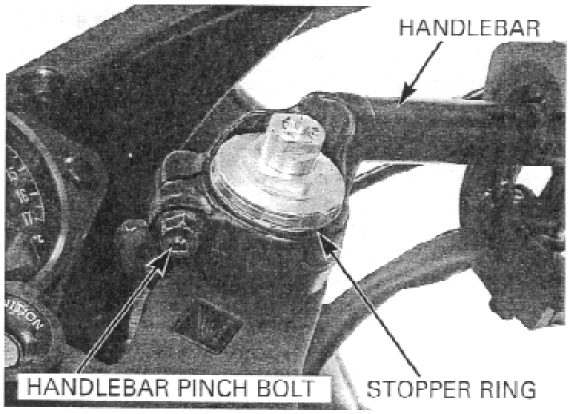


Install each handlebar onto the fork tube, aligning its boss with the groove in the fork top bridge.



Tighten the handlebar pinch bolts securely.

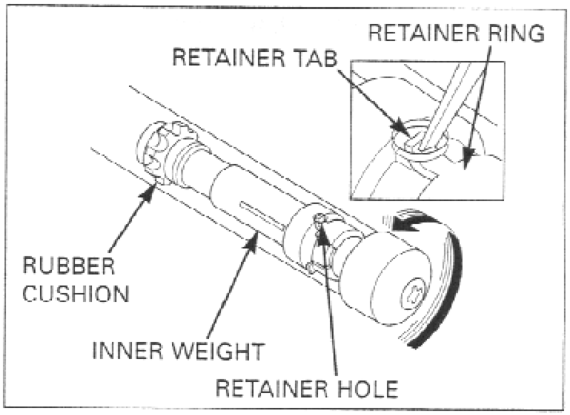
Install the stopper ring into the fork tube groove.



HANDLEBAR WEIGHT REPLACEMENT

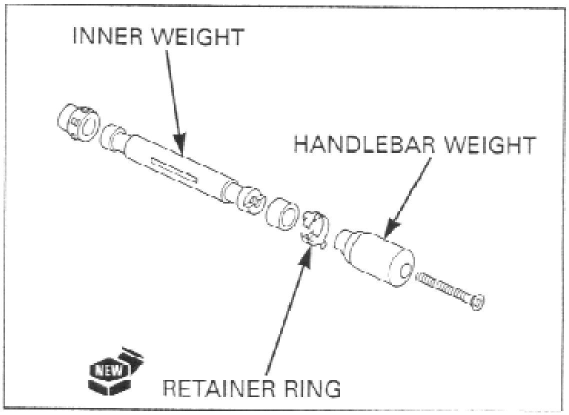
Remove the grip from the handlebar.
Straighten the weight retainer tab with a screwdriver or punch.
Temporarily install the grip end and screw, then remove the handlebar weight by turning the grip end.

Apply lubricant spray through the tab locking hole and onto the rubber for easy removal.

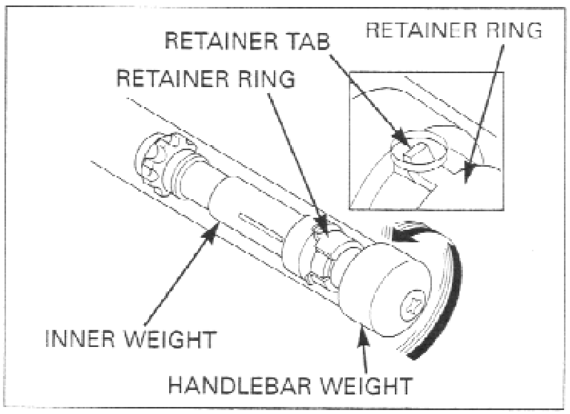


Remove the grip end from the handlebar weight.
Discard the retainer.

Install the new retainer onto the handlebar weight.
Install the grip end onto the handlebar weight aligning its boss with the slot in the handlebar weight.
Install a new mounting screw.



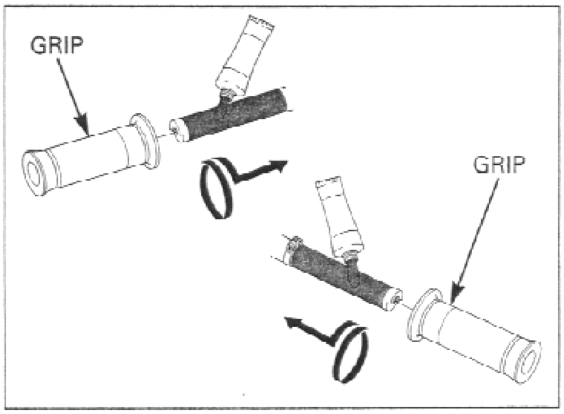
Insert the handlebar weight assembly into the handlebar.
Turn the handlebar weight and hook the retainer tab with the hole in the handlebar.



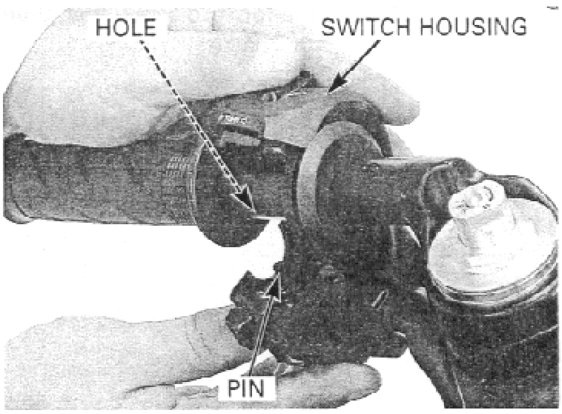
Apply Honda Bond A or Honda Hand Grip Cement (U.S.A. only) to the inside of the grip and to the clean surfaces of the left handlebar and throttle grip.

Wait 3 – 5 minutes and install the grip.
Rotate the grip for even application of the adhesive.

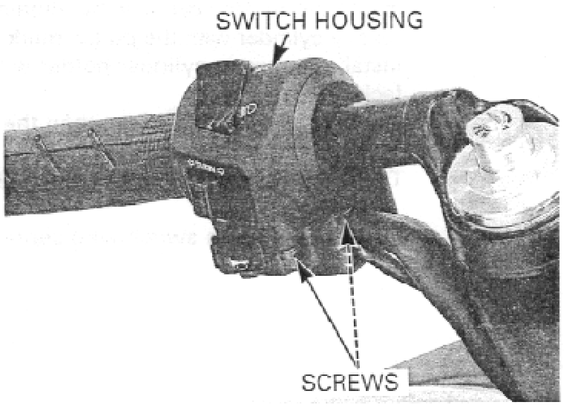
Allow the adhesive to dry for 1 hour before using.



Install the left handlebar switch housing aligning its locating pin with the hole in the handlebar.

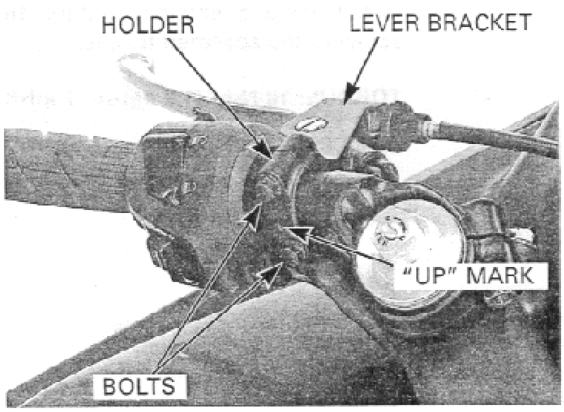


Tighten the forward screw first, then the rear screw.

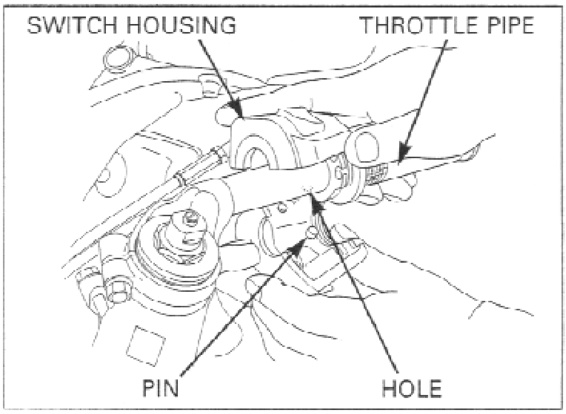


Install the clutch lever bracket assembly by aligning the end of the bracket with the punch mark on the handlebar.
Install the clutch lever bracket holder with the "UP" mark facing up.
Tighten the upper bolt first, then the lower bolt.

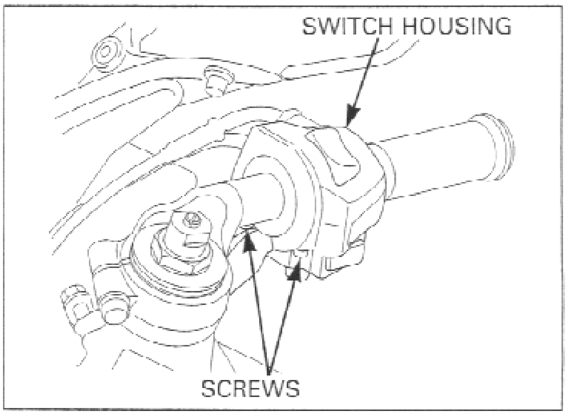
Connect the clutch switch wire connectors.



Install the right handlebar switch/throttle housing by aligning its locating pin with the hole in the handlebar.



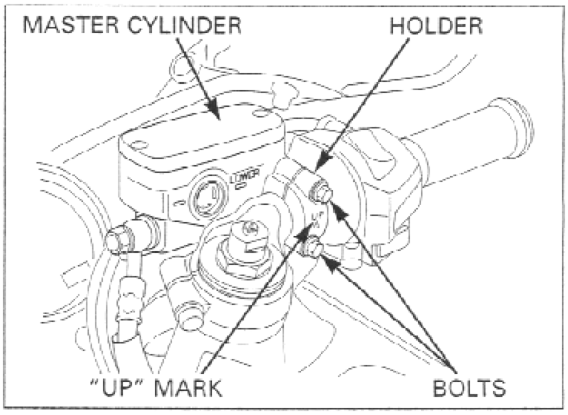
Tighten the forward screw first, then the rear screw.



Install the master cylinder by aligning the end of the master cylinder with the punch mark on the handlebar.
Install the master cylinder holder with the "UP" mark facing up.
Tighten the upper bolt first, then the lower bolt.

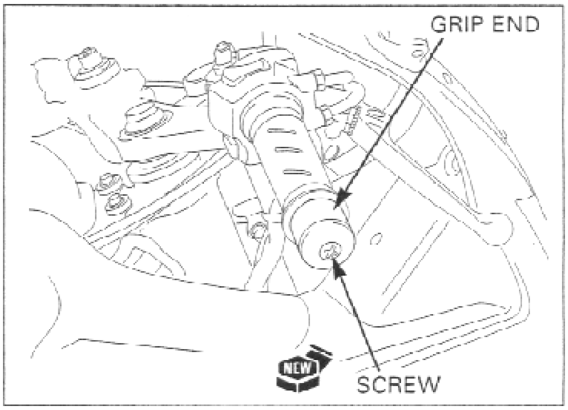
TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Connect the brake switch wire connectors.



Install the grip end and tighten the new mounting screw to the specified torque.

TORQUE: 10 N•m (1.0 kgf•m, 7 lbf•ft)

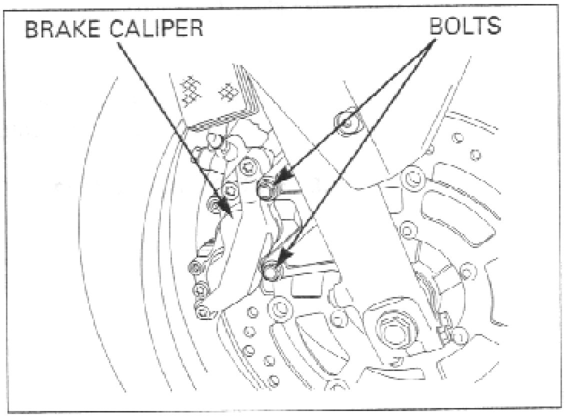


FRONT WHEEL

REMOVAL

Support the motorcycle securely using a safety stand or hoist.

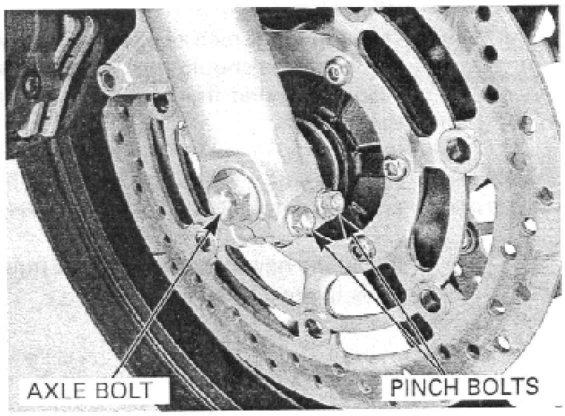
Remove the mounting bolts and both brake calipers.



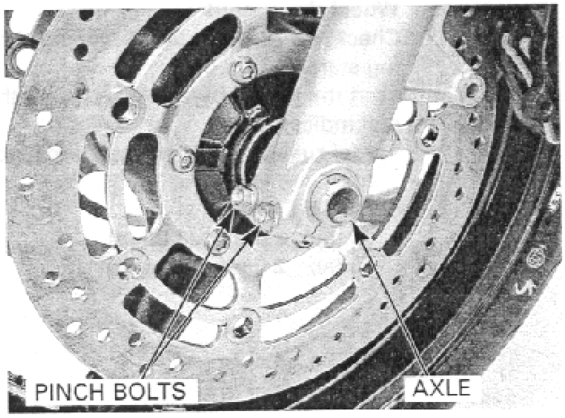
Do not operate the brake lever after the brake caliper is removed.

Support the brake caliper with a piece of wire so that it does not hang from the brake hose. Do not twist the brake hose

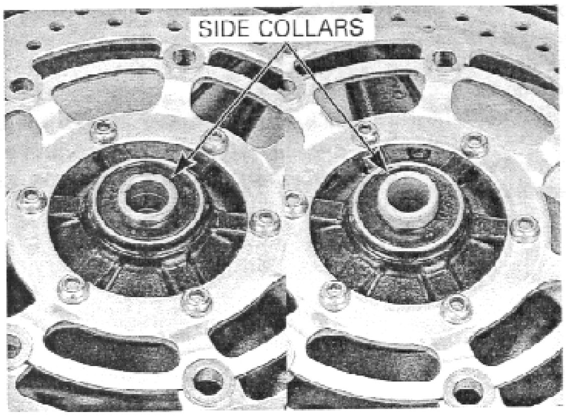
Loosen the right axle pinch bolts.
Remove the axle bolt.



Loosen the left axle pinch bolts.
Remove the axle and the front wheel.



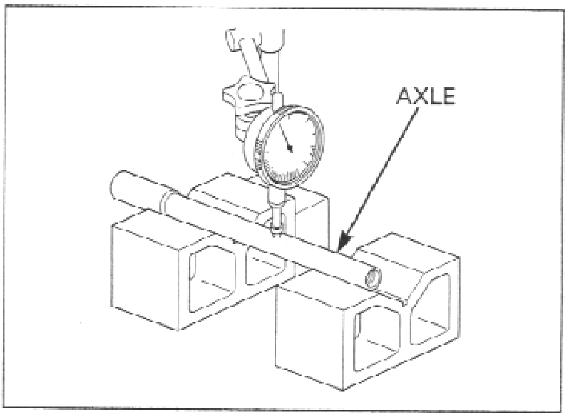
Remove the side collars.



INSPECTION

Axle
Set the axle in V-blocks and measure the runout.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)

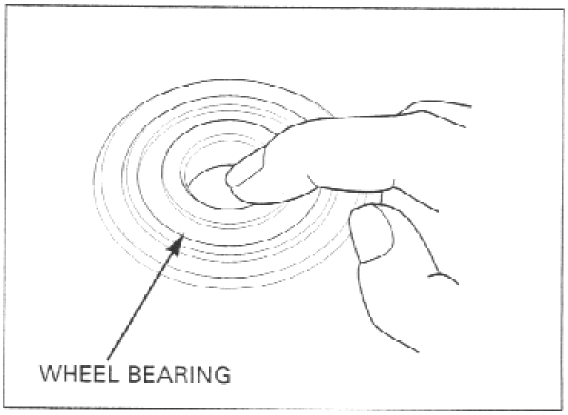


Wheel bearing
Turn the inner race of each bearing with your finger.
The bearings should turn smoothly and quietly.
Also check that the bearing outer race fits tightly in the hub.

Replace the bearings in pairs.

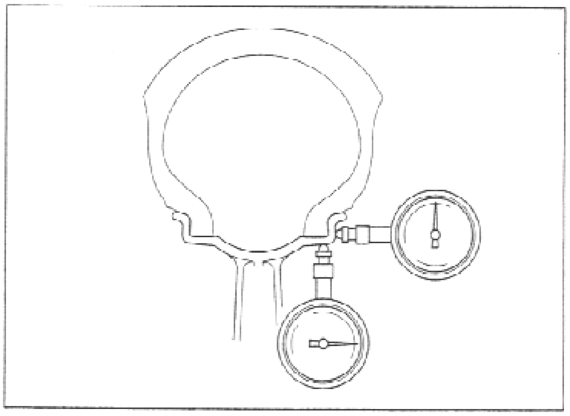
Remove and discard the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

Install the new bearings into the hub using the special tools (page 13-11).



Wheel rim runout
Check the rim runout by placing the wheel in a trueing stand.
Spin the wheel by hand and read the runout using a dial indicator.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMITS:
Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)

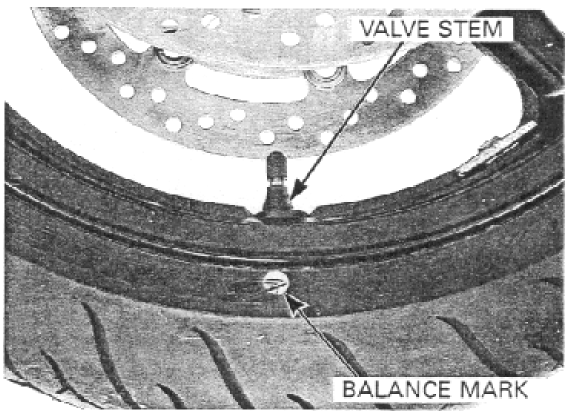


For optimum balance, the tire balance mark (a paint dot on the side wall) must be located next to the valve stem. Remount the tire if necessary.

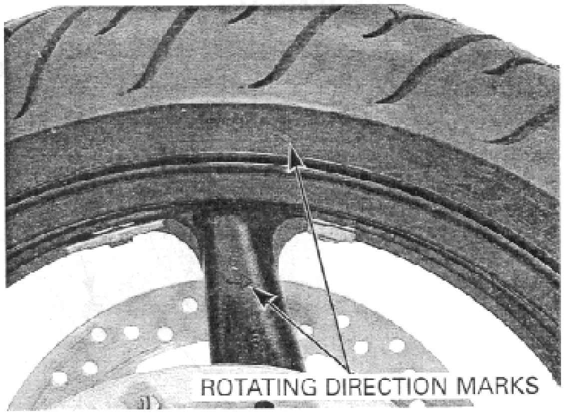
Wheel balance

NOTICE

Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Always check balance when the tire has been removed from the rim.

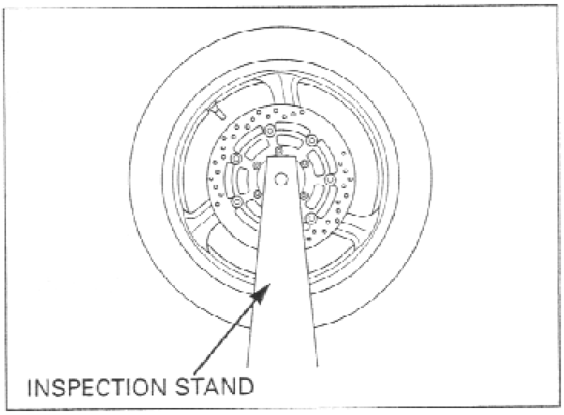


Note the rotating direction marks on the wheel and tire.



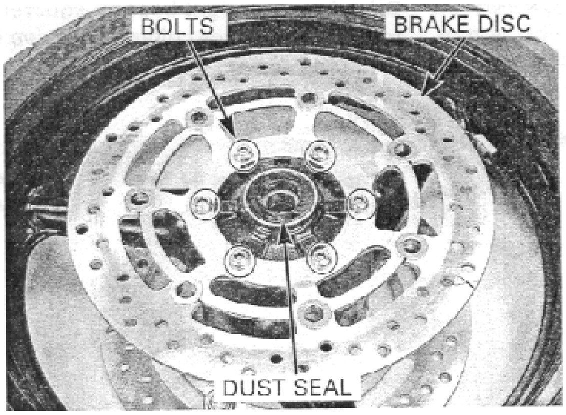
Remove the dust seals from the wheel.
Mount the wheel, tire and brake disc assembly in an inspection stand.
Spin the wheel, allow it to stop, and mark the lowest (heaviest) point of the wheel with a chalk.
Do this two or three times to verify the heaviest area.
If the wheel is balanced, it will not stop consistently in the same position.

To balance the wheel, install wheel weights on the highest side of the rim, the side opposite the chalk marks. Add just enough weight so the wheel will no longer stop in the same position when it is spun. Do not add more than 60 grams to the wheel.



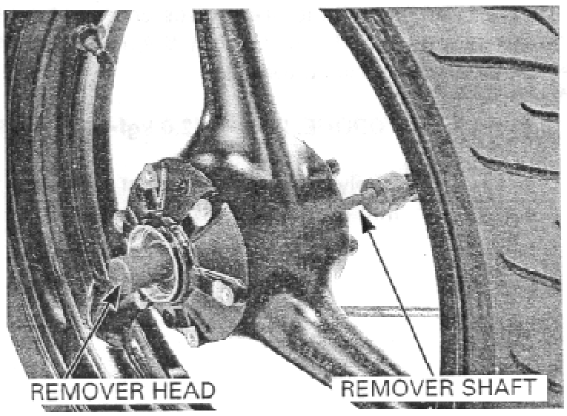
DISASSEMBLY

Remove the bolts and brake discs.
Remove the dust seals.

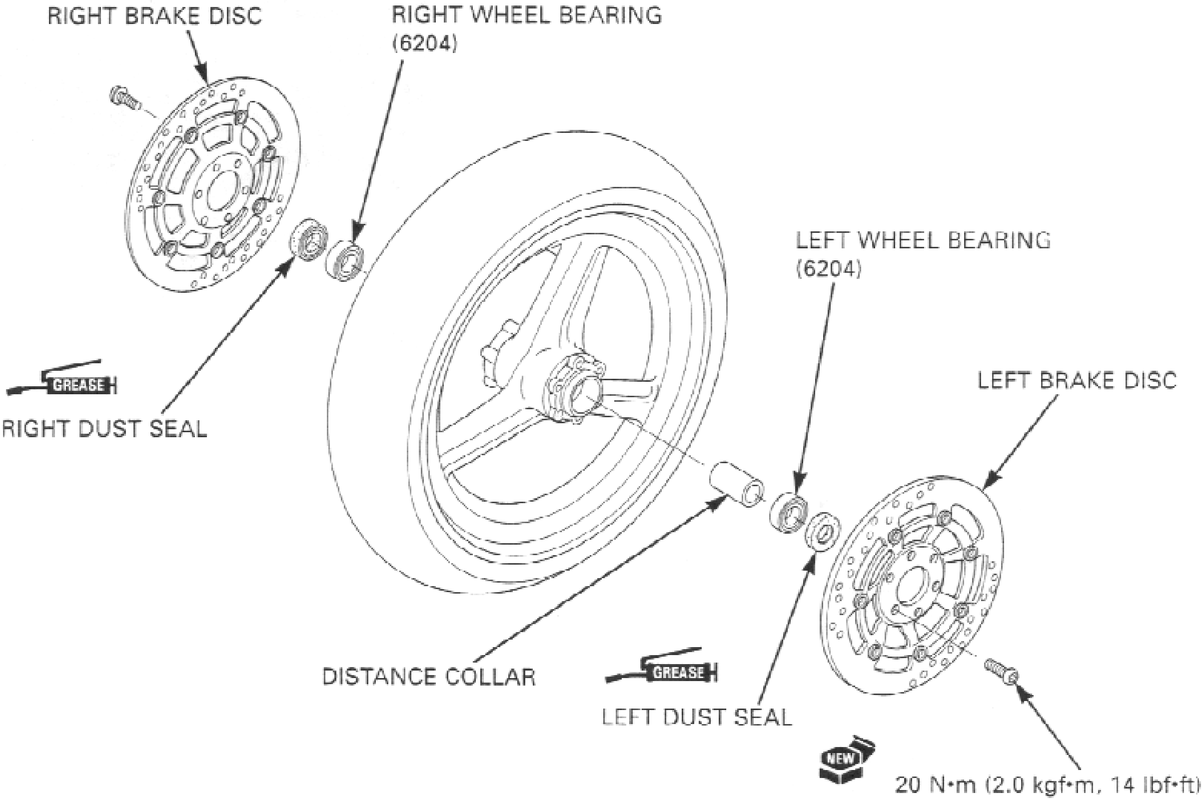


Install the bearing remover head into the bearing.
From the opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub.
Remove the distance collar and drive out the other bearing.

TOOLS:
Bearing remover head, 20 mm **07746–0050600**
Bearing remover shaft **07746–0050100**



ASSEMBLY

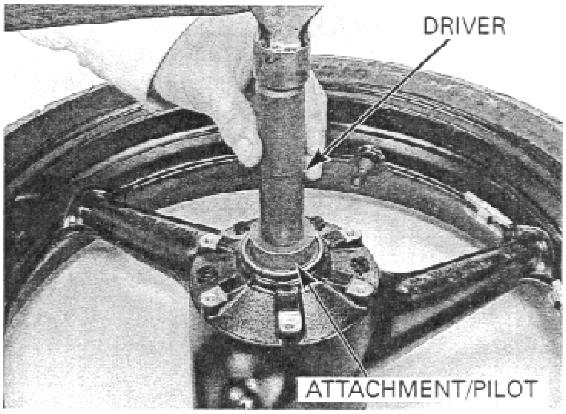


Never install the old bearings. Once the bearings have been removed, the bearing must be replaced with new ones.

Drive in a new right bearing squarely.
Install the distance collar, then drive in the left bearing using the special tool.

TOOLS:

Driver	**07749–0010000**
Attachment, 42 x 47 mm	**07746–0010300**
Pilot, 20 mm	**07746–0040500**

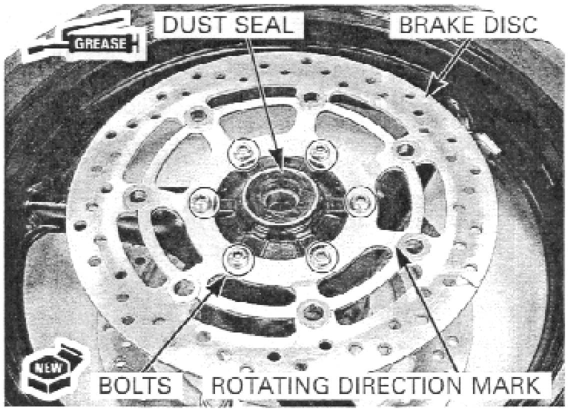


Do not get grease on the brake discs or stopping power will be reduced.

Install the brake discs on the wheel hub.
Install and tighten the new mounting bolts to the specified torque.

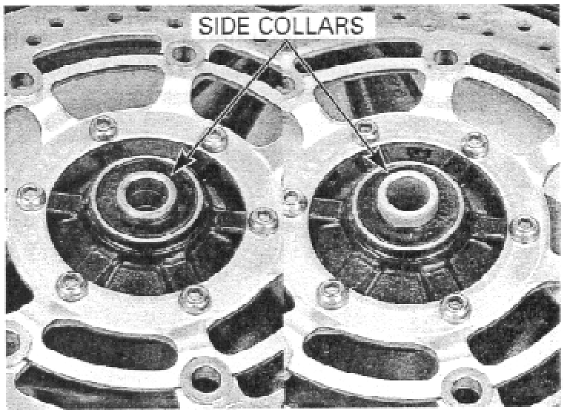
TORQUE: 20 N•m (2.0 kgf•m, 14 lbf•ft)

Apply grease to the dust seal lips, then install them into the wheel hub.



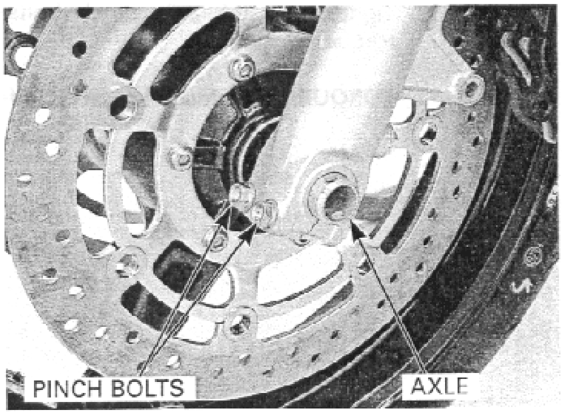
INSTALLATION

Install the side collars.



Install the front wheel between the fork legs.

Apply a thin layer of grease to the front axle surface.
Install the front axle from the left side.

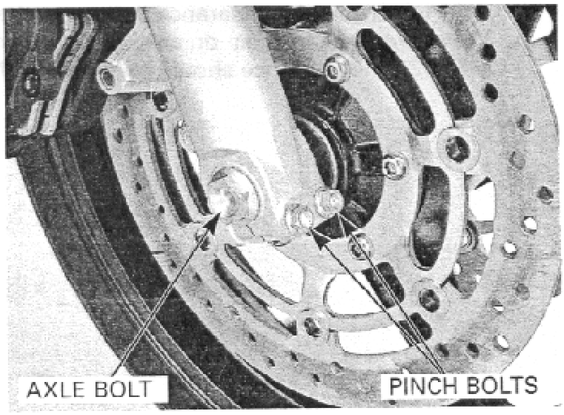


Hold the axle and tighten the axle bolt to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 43 lbf·ft)

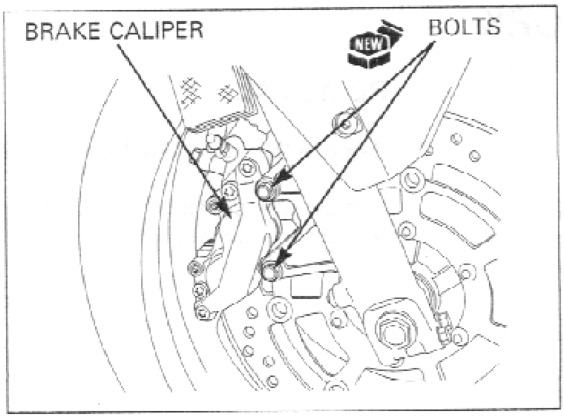
Tighten the right axle pinch bolts to the specified torque.

TORQUE: 22 N·m (2.2 kgf·m, 16 lbf·ft)

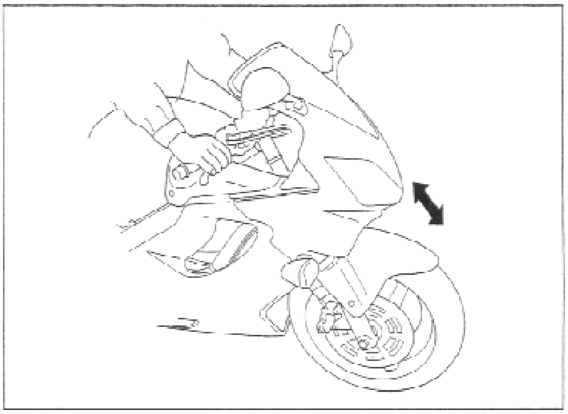


Install both brake calipers and tighten the new mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m 22 lbf·ft)

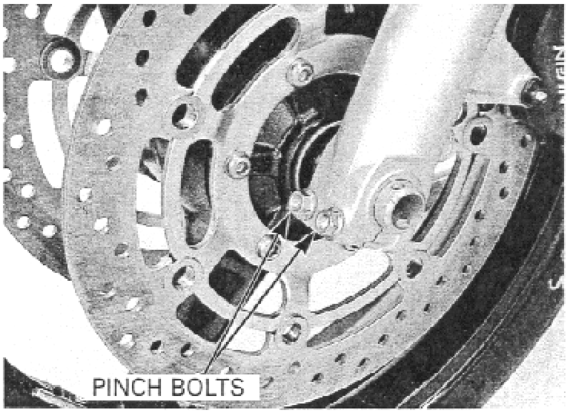


With the front brake applied, pump the fork up and down several times to seat the axle and check brake operation by applying the brake lever.

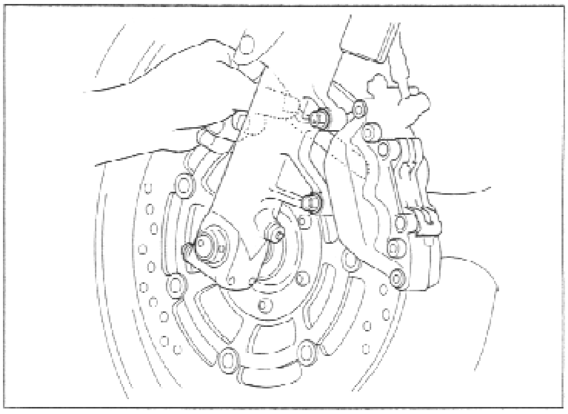


Tighten the left axle pinch bolts to the specified torque.

TORQUE: 22 N•m (2.2 kgf•m, 16 lbf•ft)



Check the clearance between the brake disc and caliper bracket on each side after installation.
The clearance should be at least 0.7 mm (0.03 in).

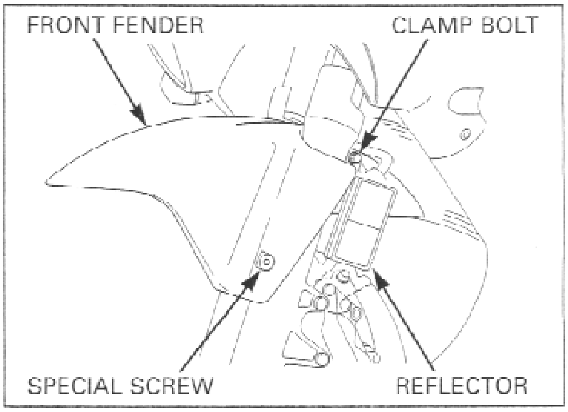


FORK

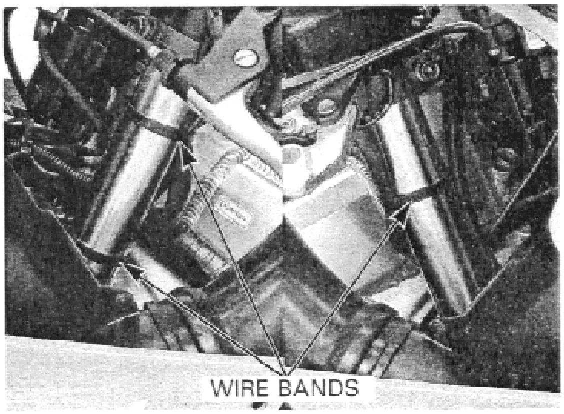
REMOVAL

Remove the front wheel (page 13-9).

Remove the special screws, brake hose clamp bolts, reflectors and front fender.



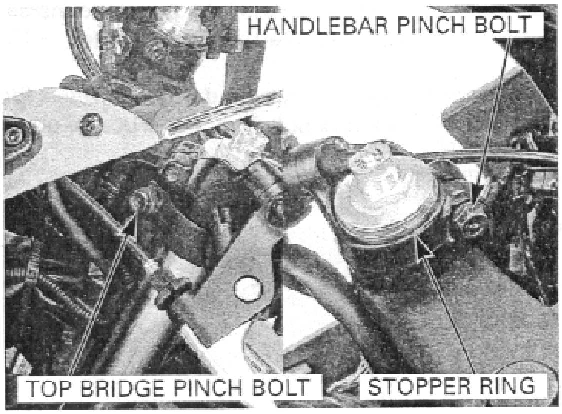
Remove the handlebar switch wire band.



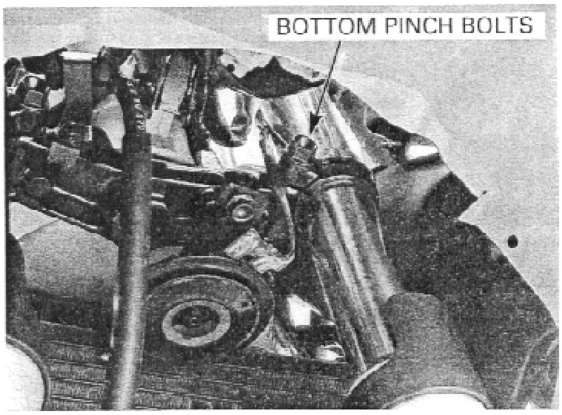
Remove the handlebar stopper ring.
Loosen the handlebar pinch bolt and top bridge pinch bolt.
When the fork leg will be disassembled, loosen the fork cap, but do not remove it yet.

Keep the brake master cylinders upright.

Remove the handlebar assembly and secure it.



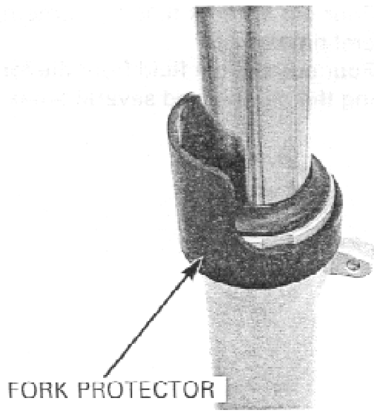
Loosen the fork bottom pinch bolts and remove the fork tube from the fork top bridge and steering stem.



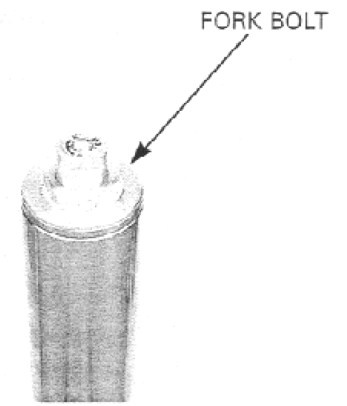
DISASSEMBLY

Be careful not to scratch the fork tube or damage the dust seal.

Remove the fork protector by prying it carefully using a screwdriver.



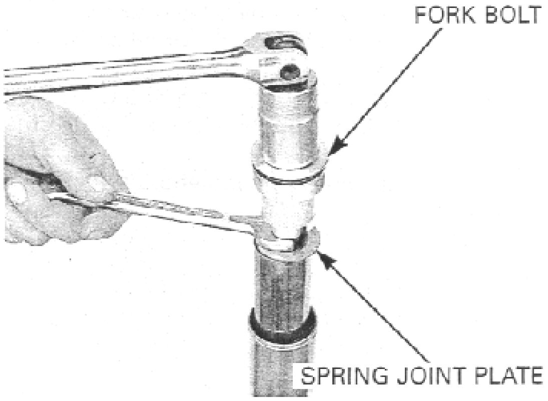
Remove the fork bolt from the fork tube.



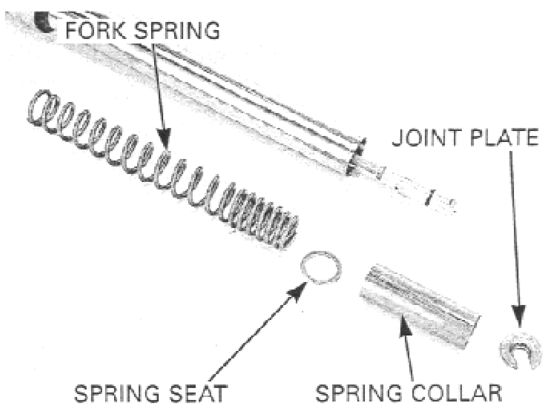
Push down the joint plate and install the 14-mm spanner onto the rebound adjuster.

Do not remove the rebound damping adjuster from the damper rod, or fork damping force will be change.

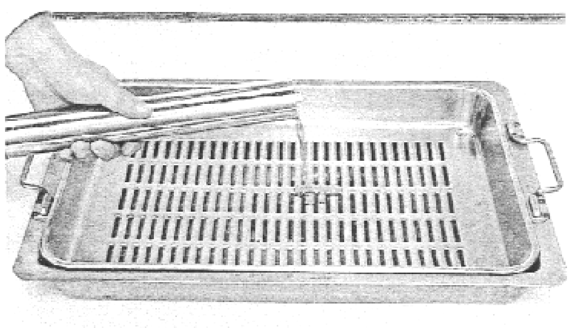
Hold the rebound adjuster, then loosen and remove the fork bolt from the rebound adjuster.



Remove the following:
- Spring joint plate
- Spring collar
- Spring seat
- Fork spring

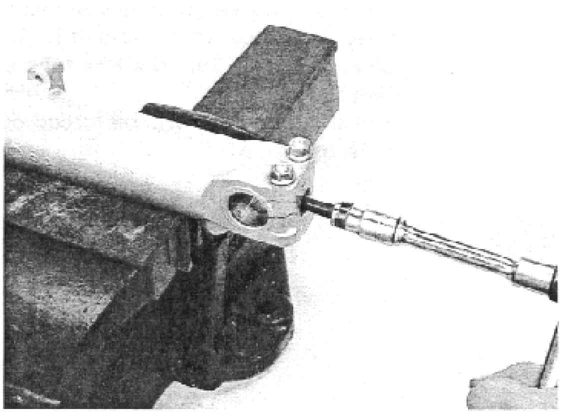


Pour out the fork fluid by pumping the fork tube several times.
Pour out the fork fluid from the fork damper by pumping the damper rod several times.

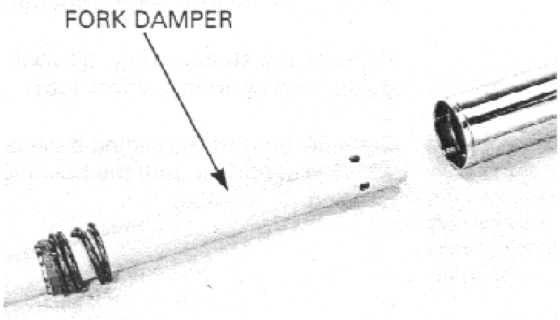


If the fork damper turns together with the socket bolt, temporarily install the fork spring, spring seat, collar and fork bolt.

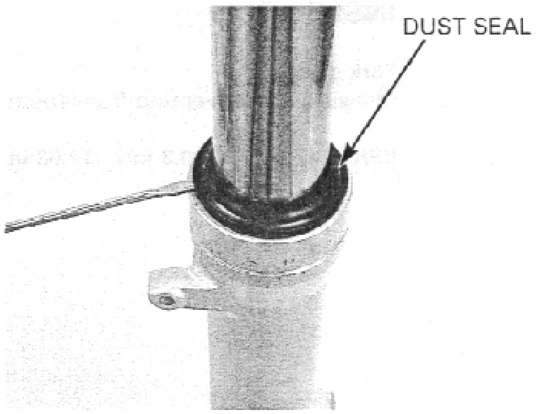
Hold the axle holder in a vice with soft jaws or a shop towel.
Remove the fork damper socket bolt and sealing washer.



Remove the fork damper assembly from the fork tube.

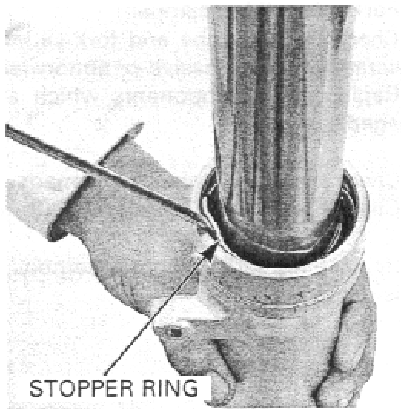


Remove the dust seal.

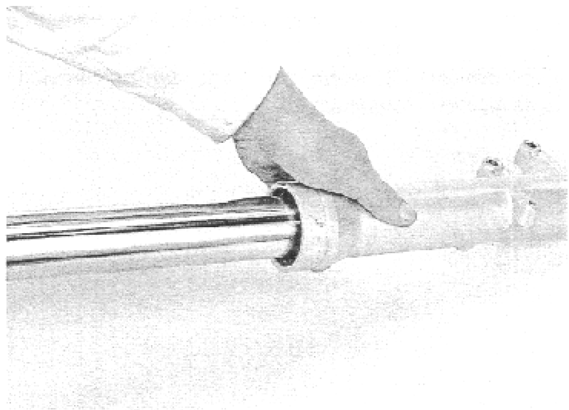


Do not scratch the fork tube sliding surface.

Remove the oil seal stopper ring.



Pull the fork tube out until you feel resistance from the slider bushing. Then move it in and out, tapping the bushing lightly until the fork tube separates from the fork slider.
The slider bushing will be forced out by the fork tube bushing.

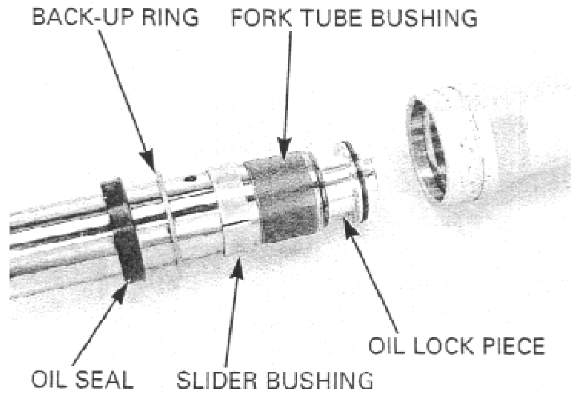


Remove the oil lock piece from the fork slider.

Remove the stopper ring, oil seal, back-up ring and guide bushing from the fork tube.

Do not remove the sliding bushing unless it is necessary to replace it with a new one.

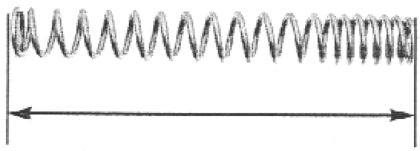
Carefully remove the sliding bushing by prying the slit with a screwdriver until the bushing can be pulled off by hand.



INSPECTION

Fork spring
Measure the fork spring free length.

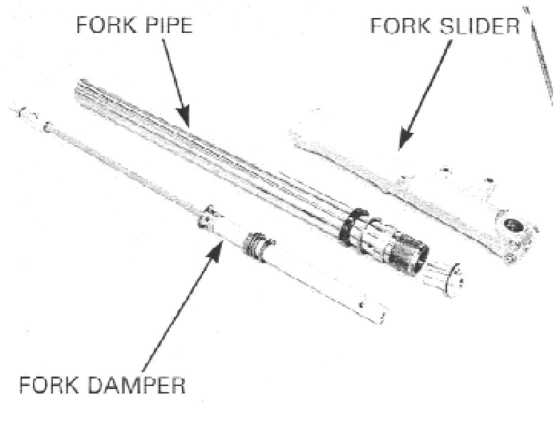
SERVICE LIMIT: 280.3 mm (11.03 in)



Fork tube/slider/damper
Check the fork tube and fork slider for score marks, scratches, or excessive or abnormal wear.
Replace any components which are worn or damaged.

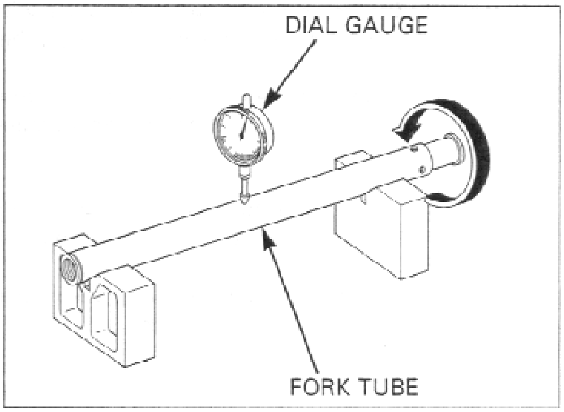
Check the fork damper for damage.
Check the oil lock valve for wear or damage.

Replace the fork damper assembly, if any component is damaged.



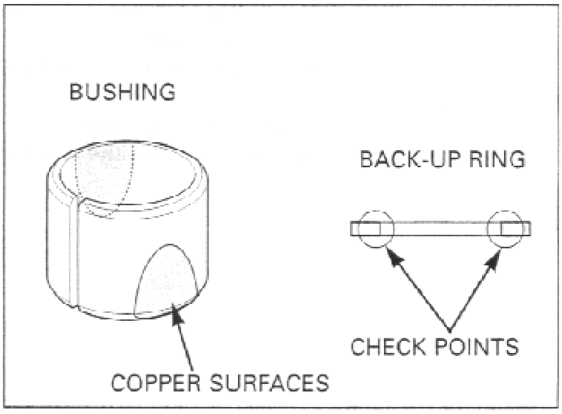
Place the fork tube in V-blocks and measure the runout.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

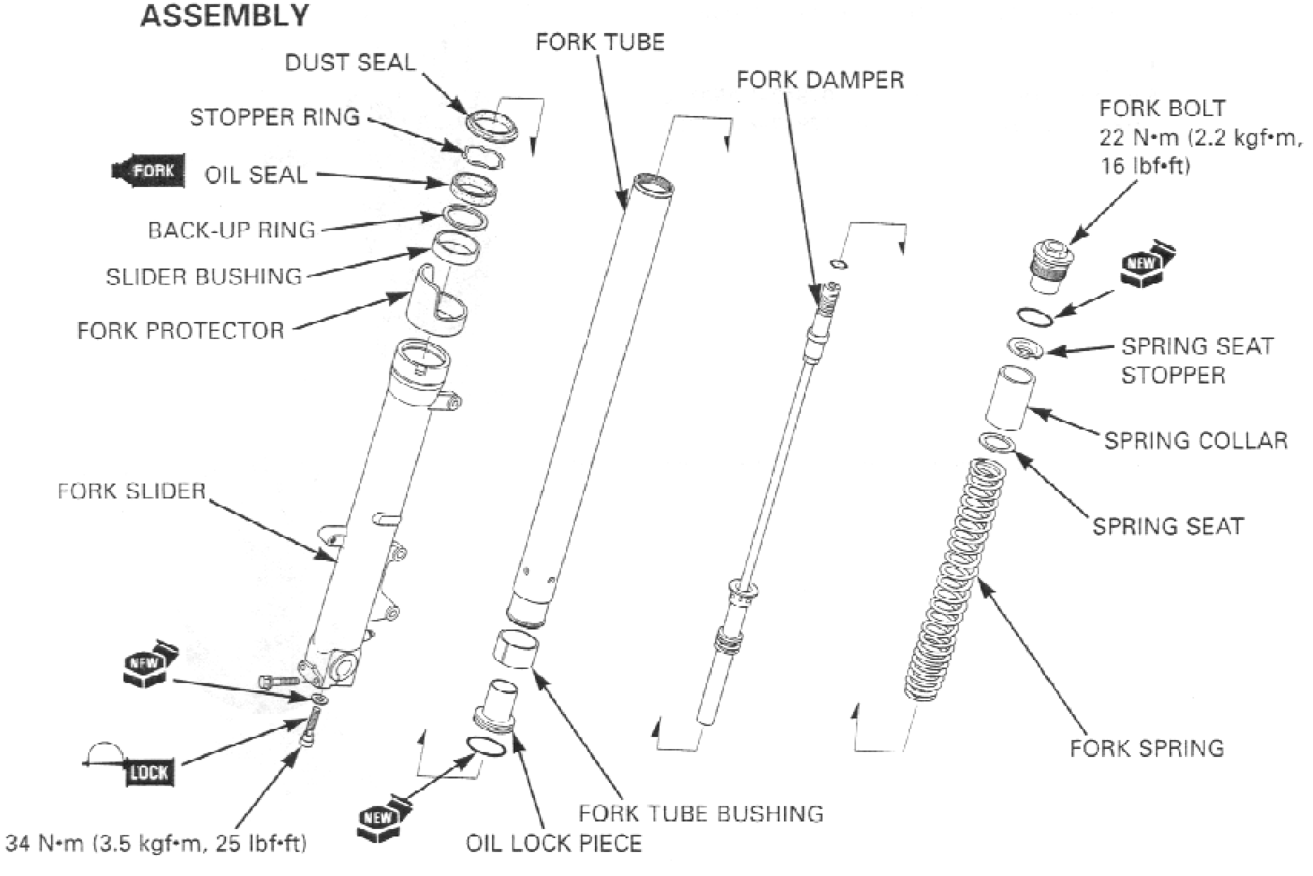


Fork tube bushing
Visually inspect the slider and fork tube bushings.
Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

Check the back-up ring; replace it if there is any distortion at the points shown.



ASSEMBLY



Before assembly, wash all parts with a high flash or non-flammable solvent and wipe them dry.

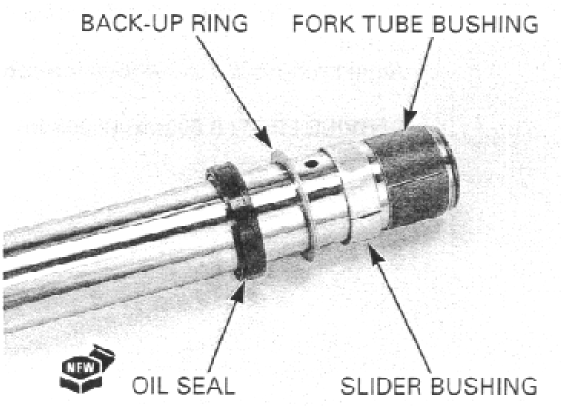
Do not open the bushing slit more than necessary

Install the new sliding bushing being careful not to damage the coating of the bushing if it has been removed.

Remove the burrs from the bushing mating surface, being careful not to peel off the coating.

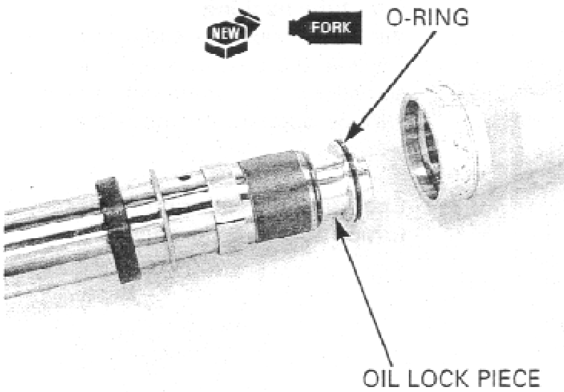
Install the oil seal with its marked side facing up.

Install the guide bushing, back-up ring and new oil seal onto the fork slider.



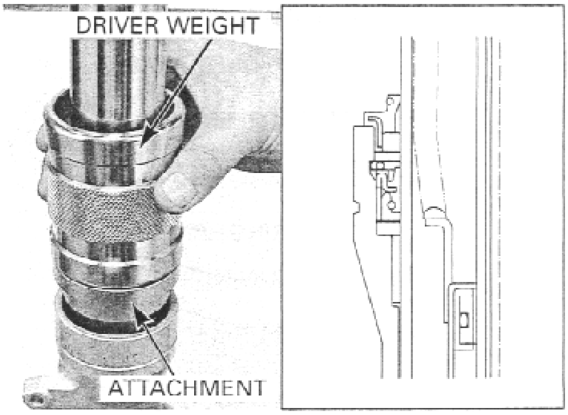
Coat a new O-ring with fork fluid and install it into the groove in the oil lock piece.
Install the oil lock piece into the fork tube.

Apply fork fluid to the oil seal lips.
Install the fork slider into the fork tube.

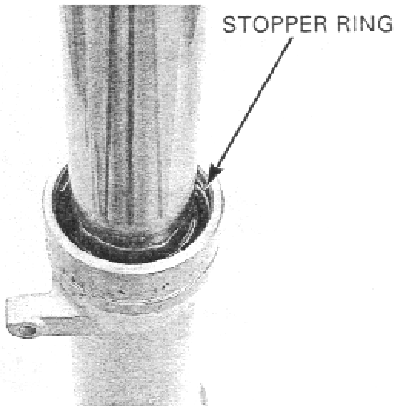


Drive the oil seal in using the special tools.

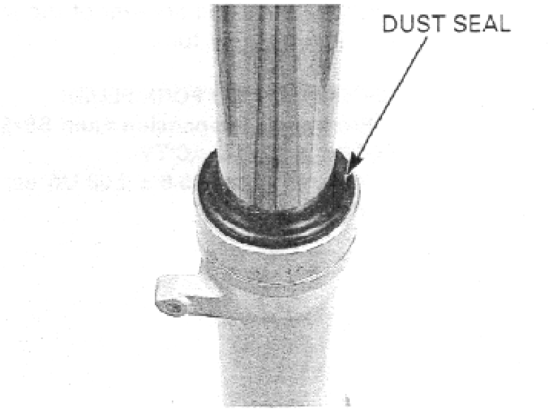
TOOL:
Fork seal driver weight **07947–KA50100**
Fork seal driver attachment **07947–KA40200**



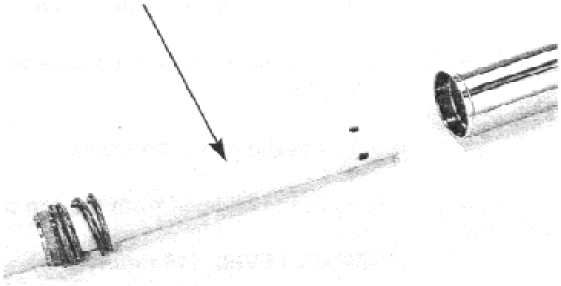
Install the stopper ring into the fork slider groove securely.



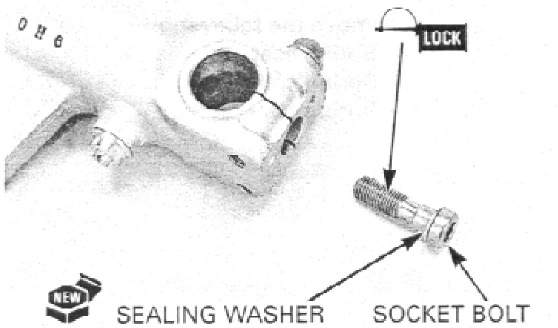
Install the dust seal.



Install the fork damper assembly into the fork tube.



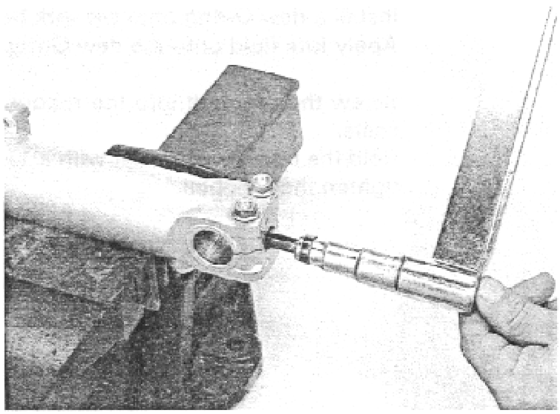
Apply a locking agent to the fork socket bolt threads.
Install the socket bolt with a new sealing washer.



If the fork damper turns together with the socket bolt, temporarily install the fork spring, spring seat, collar and fork bolt.

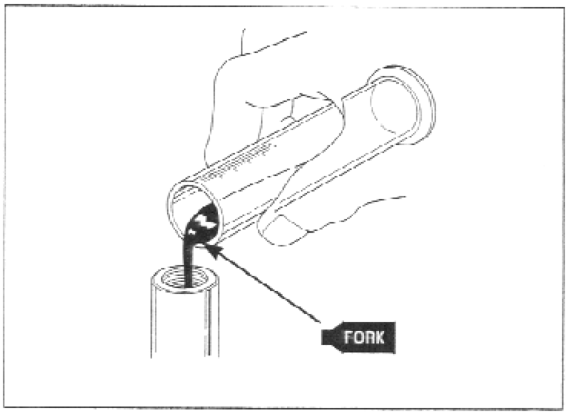
Hold the axle holder in a vise with soft jaws or a shop towel.
Tighten the fork socket bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)



Pour the specified amount of the recommended fork fluid into the fork tube.

RECOMMENDED FORK FLUID:
Pro Honda Suspension Fluid SS-8
FORK FLUID CAPACITY:
462 ± 2.5 cm^3 (15.6 ± 0.08 US oz, 16.3 ± 0.09 Imp oz)



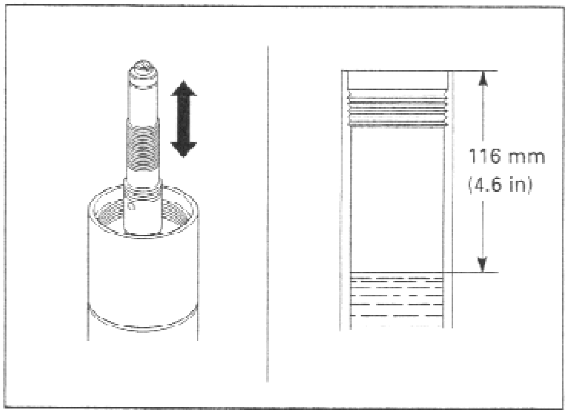
Pump the damper rod several times until the fork fluid flows out of the oil hole in the rebound damping adjuster.
Slowly pump the fork tube several times to remove the trapped air.

Compress the fork tube slowly.

Make sure the oil level is the same in the both forks.

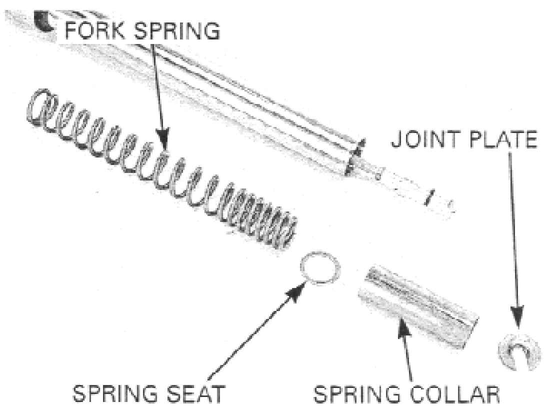
Measure the oil level from the top of the fork tube.

FORK OIL LEVEL: 116 mm (4.6 in)



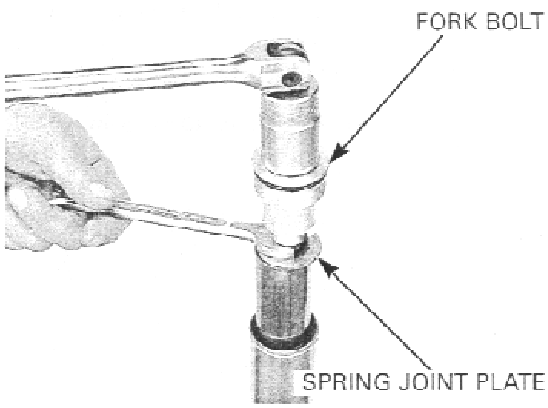
Pull the damper rod up and install the fork spring with the tapered end facing up.

Remove the following:
- Spring seat
- Spring collar
- Spring joint plate

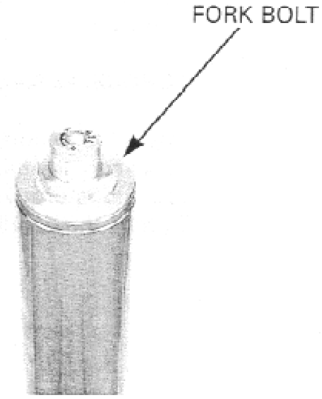


Install a new O-ring onto the fork bolt.
Apply fork fluid onto the new O-ring.

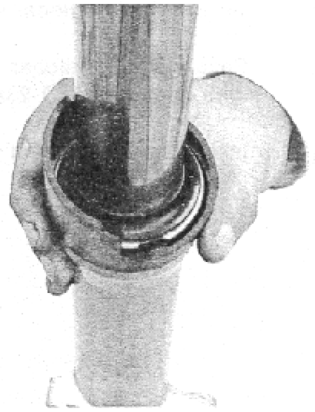
Screw the fork bolt into the rebound adjuster until it seats.
Hold the rebound adjuster with a 17-mm spanner and tighten the fork bolt.



Screw the fork bolt into the fork tube.



Install the fork protector.

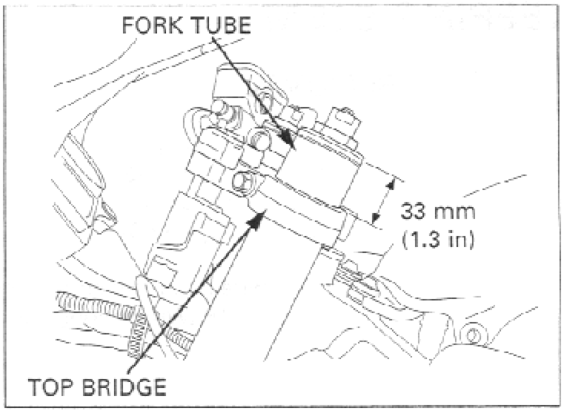


INSTALLATION

Install the fork leg through the bottom bridge and top bridge so that the height from the top bridge upper surface to the fork tube end is 33 mm (1.3 in).

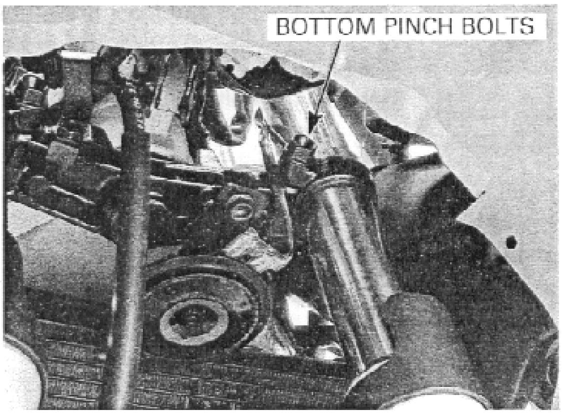
Tighten the fork top bridge pinch bolt to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



Tighten the bottom bridge pinch bolts to the specified torque.

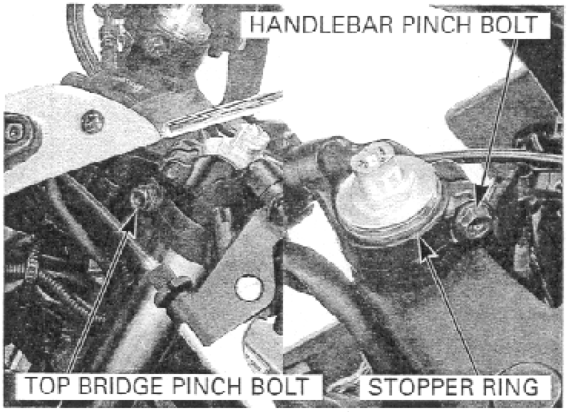
TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)



Tighten the fork bolt to the specified torque if it was removed.

TORQUE: 23 N•m (2.3 kgf•m, 17 lbf•ft)

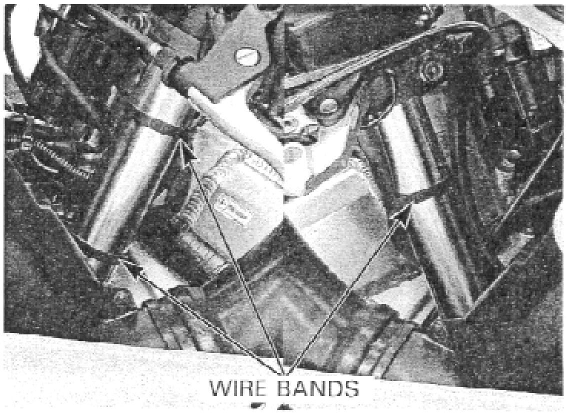
Install the handlebar.
Make sure the handlebar boss is positioned in the fork top bridge groove.
Tighten the handlebar pinch bolt securely.



Right fork: Secure the handlebar switch wire with the wire band.

Left fork: Secure the handlebar switch and horn wire with the wire bands (page 1-23).

Install the front wheel (page 13-13).

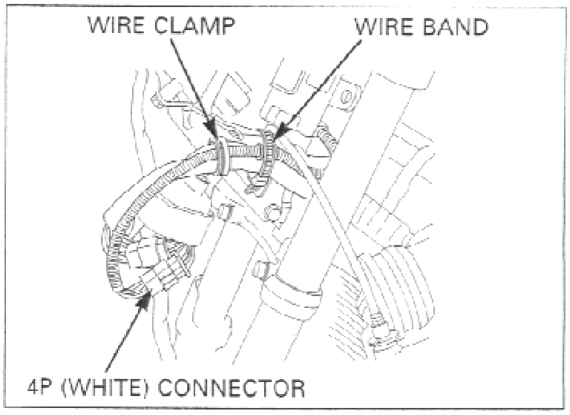


STEERING STEM

REMOVAL

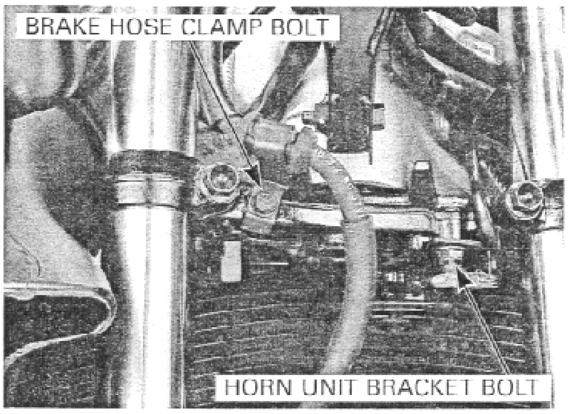
Remove the following:
- Front wheel (page 13-9)
- Upper cowl (page 2-7)
- Handlebars (page 13-3)

Release the wire band and clamp, then disconnect the ignition switch 4P (White) connector.

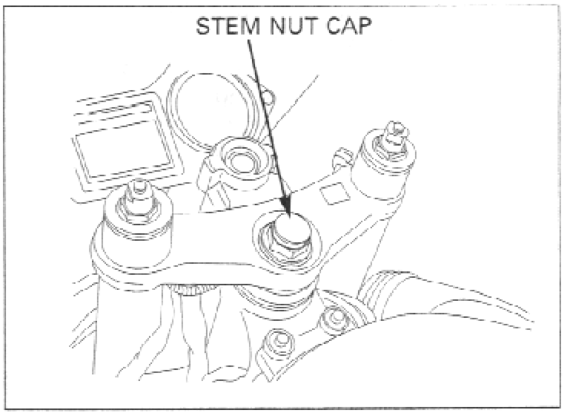


Remove the bolt and front brake hose clamp.

Disconnect the horn connector.
Remove the bolt and horn unit.

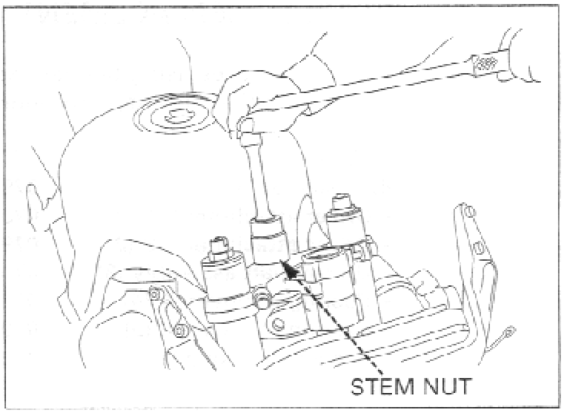


Remove the steering stem nut cap.



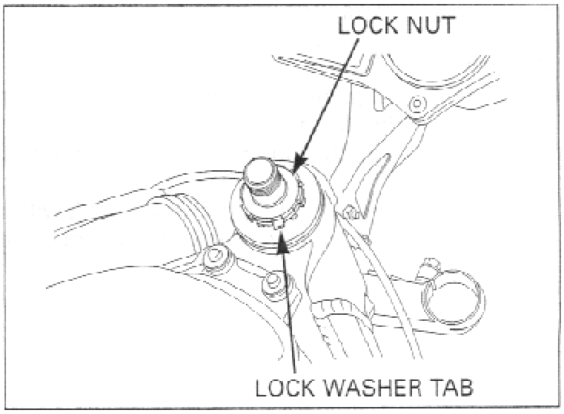
Remove the stem nut and the top bridge.

Remove the fork legs (page 13-14).



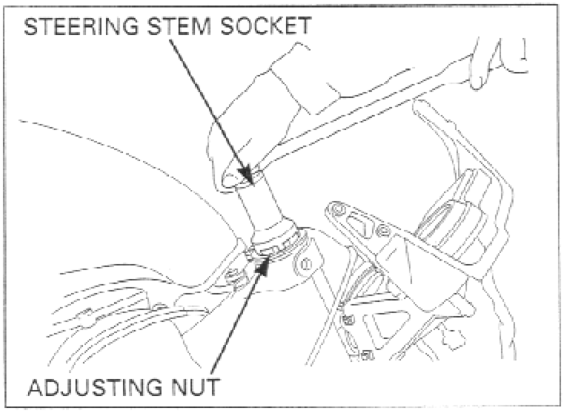
Straighten the tabs of the lock washer.

Remove the steering bearing adjustment nut lock nut and lock washer.

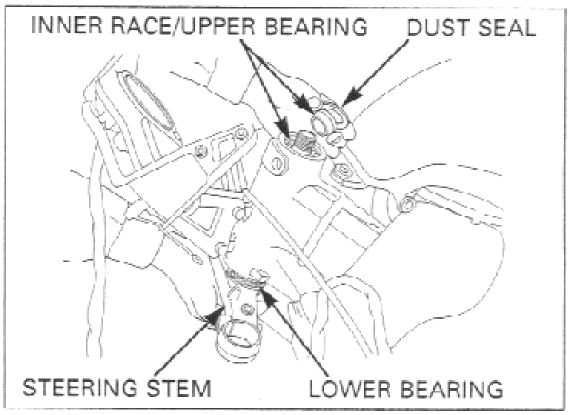


Remove the steering stem bearing adjustment nut using the special tool.

TOOL:
Steering stem socket **07916–3710101**



Remove the following:
- Dust seal
- Upper bearing inner race
- Upper bearing
- Steering stem
- Lower bearing



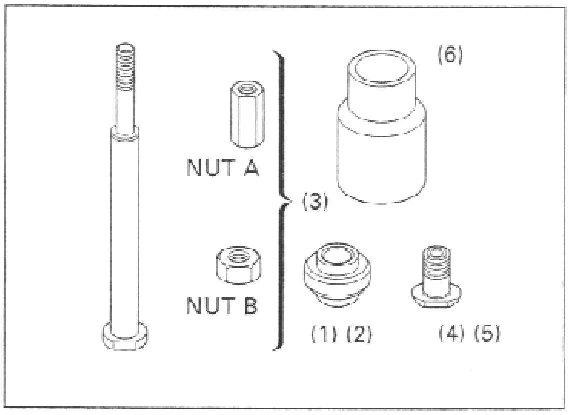
BEARING REPLACEMENT

Always replace the bearings and races as a set.

Replace the races using the ball race remover set as described in the following procedure.

TOOLS:

Ball race remover set	**07946-KM90001**
- Driver attachment, A (1)	**07946-KM90100**
- Driver attachment, B (2)	**07946-KM90200**
- Driver shaft assembly (3)	**07946-KM90300**
- Bearing remover, A (4)	**07946-KM90401**
- Bearing remover, B (5)	**07946-KM90500**
- Assembly base (6)	**07946-KM90600**

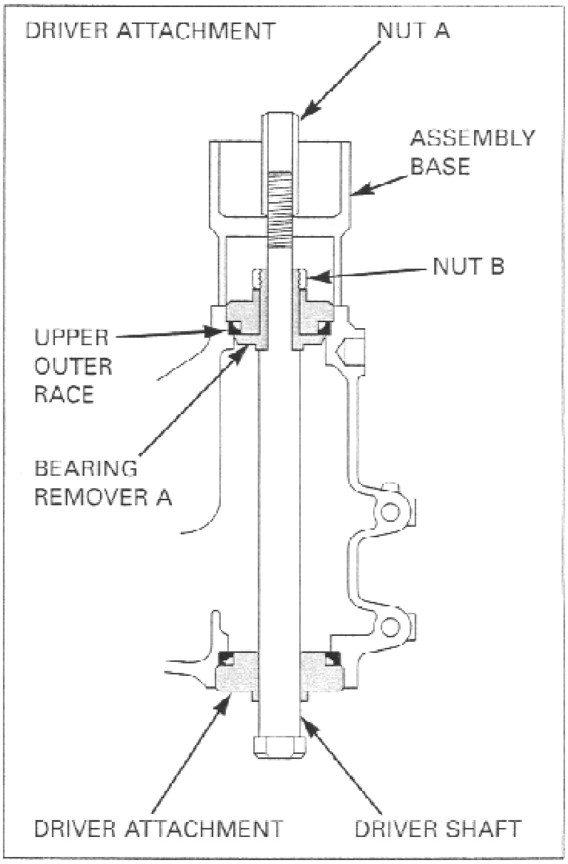


Note the installation direction of the assembly base.

Install the ball race remover into the head pipe as shown.

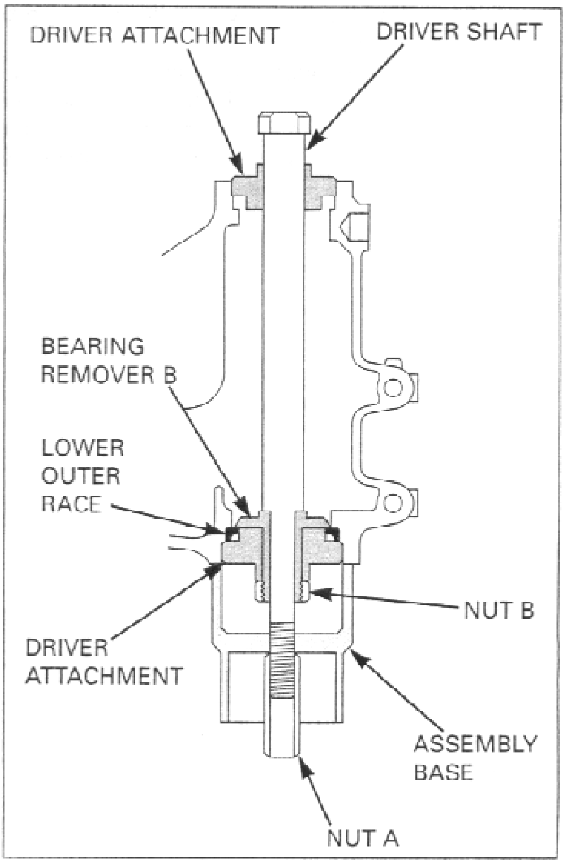
Align bearing remover A with the groove in the steering head.
Lightly tighten nut B with a wrench.

While holding the driver shaft with a wrench, turn nut A gradually to remove the upper bearing outer race.

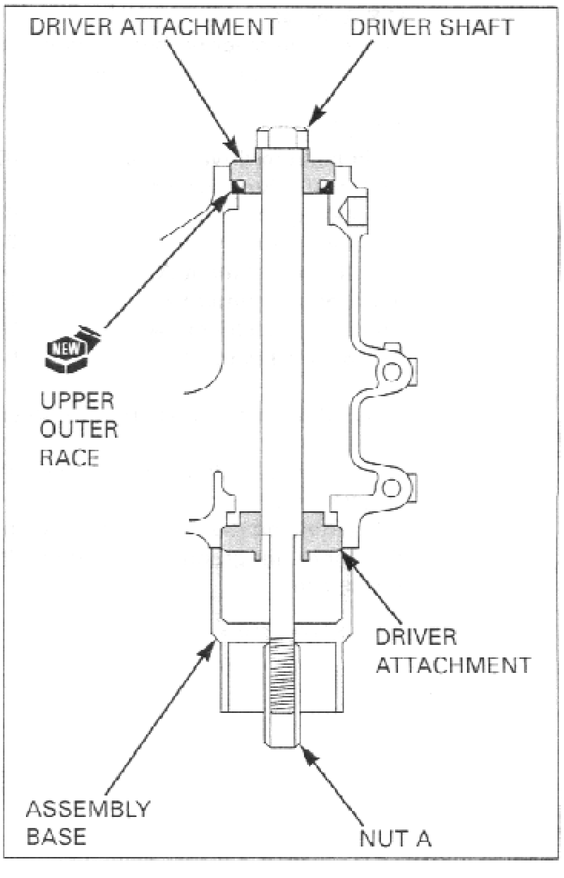


Note the installation direction of the assembly base.

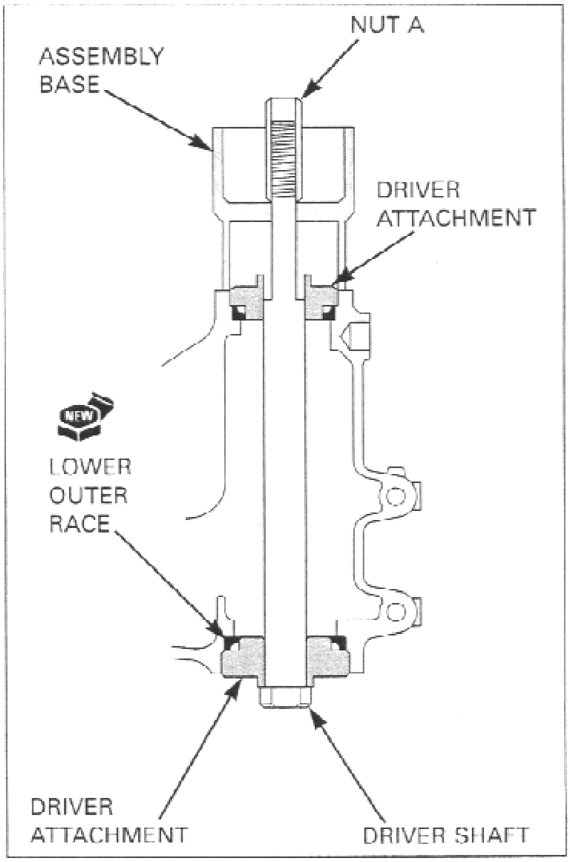
Install the ball race remover into the steering head pipe as shown.
Align bearing remover B with the groove in the steering head.
Lightly tighten nut B.
While holding the driver shaft, turn nut A gradually to remove the lower bearing outer race.



Install a new upper outer race and the ball race remover as shown.
While holding the driver shaft with a wrench, turn nut A gradually until the groove in driver attachment A aligns with the upper end of the steering head. This will allow you to install the upper bearing outer race.



Install a new lower outer race and ball race remover as shown.
While holding the driver shaft with a wrench, turn nut A gradually until the groove in driver attachment B aligns with the lower end of the steering head. This will allow you to install the lower bearing outer race.

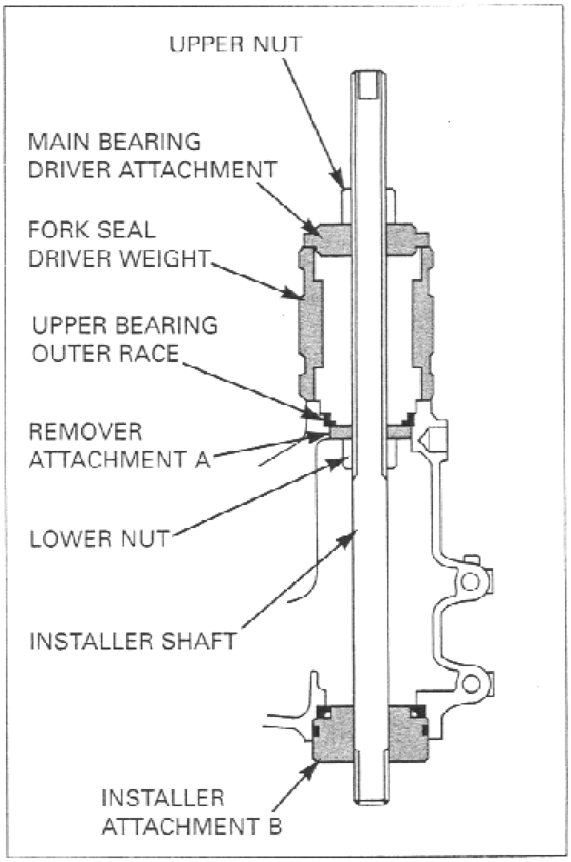


U.S.A. only:
Replace the steering head bearing outer races using the special tools listed below.

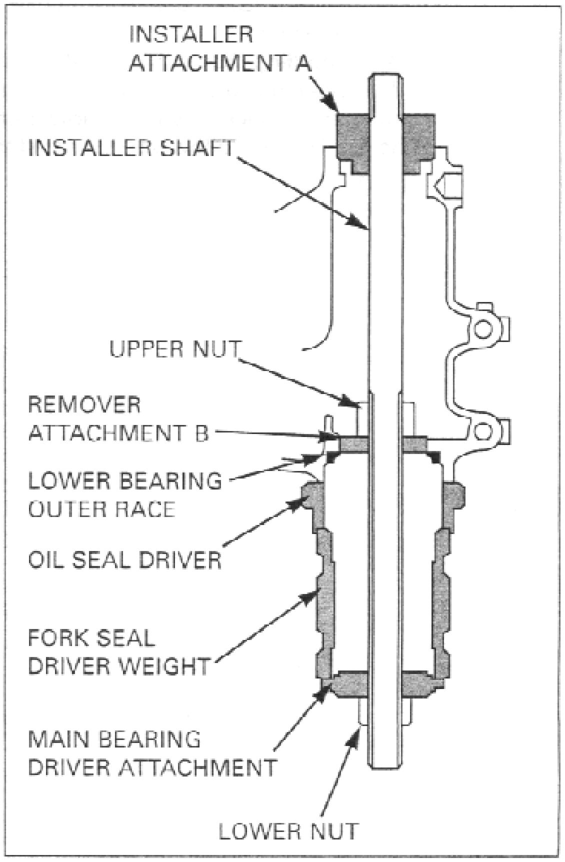
TOOLS:

Main bearing driver attachment	**07946–ME90200**
Fork seal driver weight	**07947–KA50100**
Oil seal driver	**07965–MA60000**
Installer shaft	**07VMF–KZ30200**
Installer attachment A	**07VMF–MAT0100**
Installer attachment B	**07VMF–MAT0200**
Remover attachment A	**07VMF–MAT0300**
Remover attachment B	**07VMF–MAT0400**

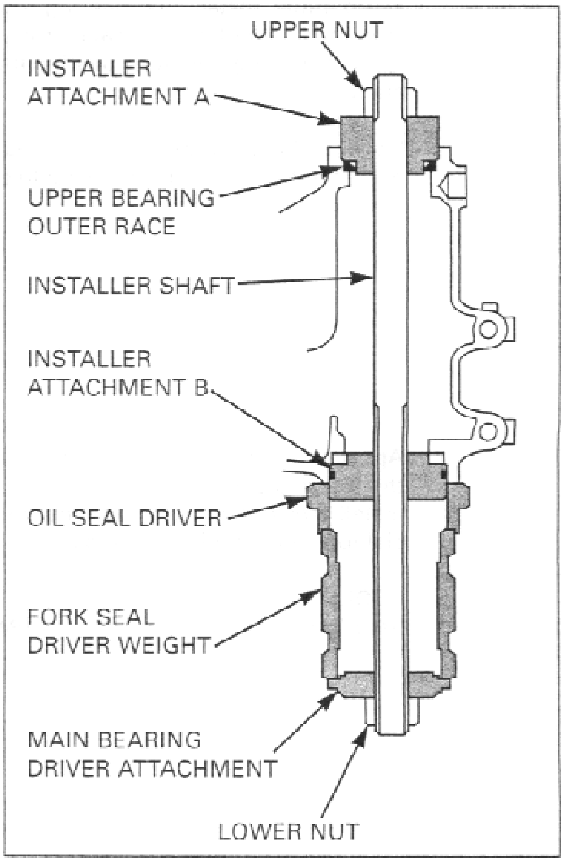
Install the special tools into the steering head pipe as shown.
Align remover attachment A with the groove in the steering head.
While holding the installer shaft with the wrench, turn the upper nut gradually to remove the upper bearing outer race.



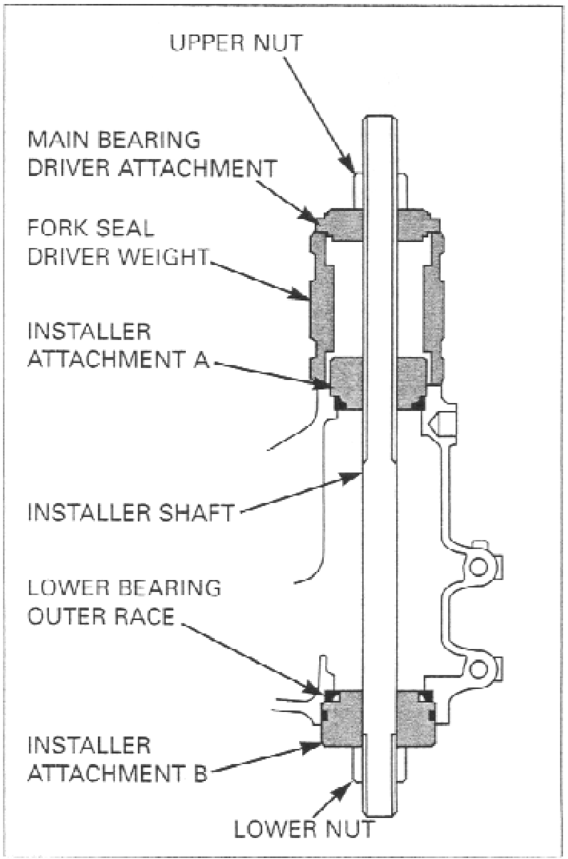
Install the special tools into the steering head pipe as shown.
Align remover attachment B with the groove in the steering head.
While holding the installer shaft with the wrench, turn the lower nut gradually to remove the lower bearing outer race.



Install a new upper bearing outer race and the special tools as shown.
While holding the installer shaft with the wrench, turn the lower nut gradually until the groove in installer attachment A aligns with the upper end of the steering head. This will allow you to install the upper bearing outer race.

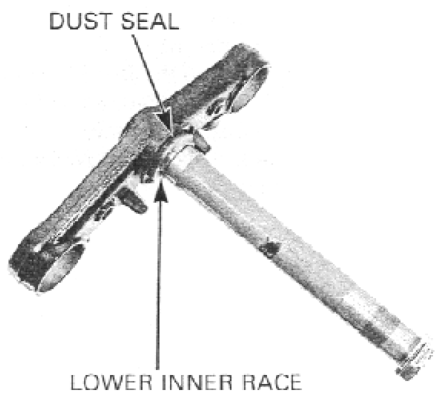


Install a new lower bearing outer race and the special tools as shown.
While holding the installer shaft with the wrench, turn the upper nut gradually until the groove in installer attachment B aligns with the lower end of the steering head. This will allow you to install the lower bearing outer race.



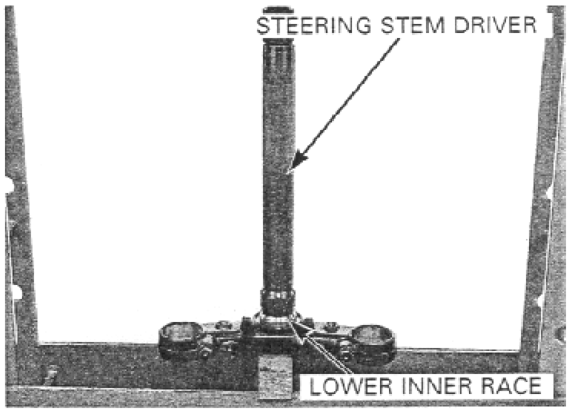
Temporarily install the steering stem nut onto the stem to prevent the threads from being damaged when removing the lower bearing inner race from the stem.

Remove the lower bearing inner race with a chisel or equivalent tool, being careful not to damage the stem.
Remove the dust seal.



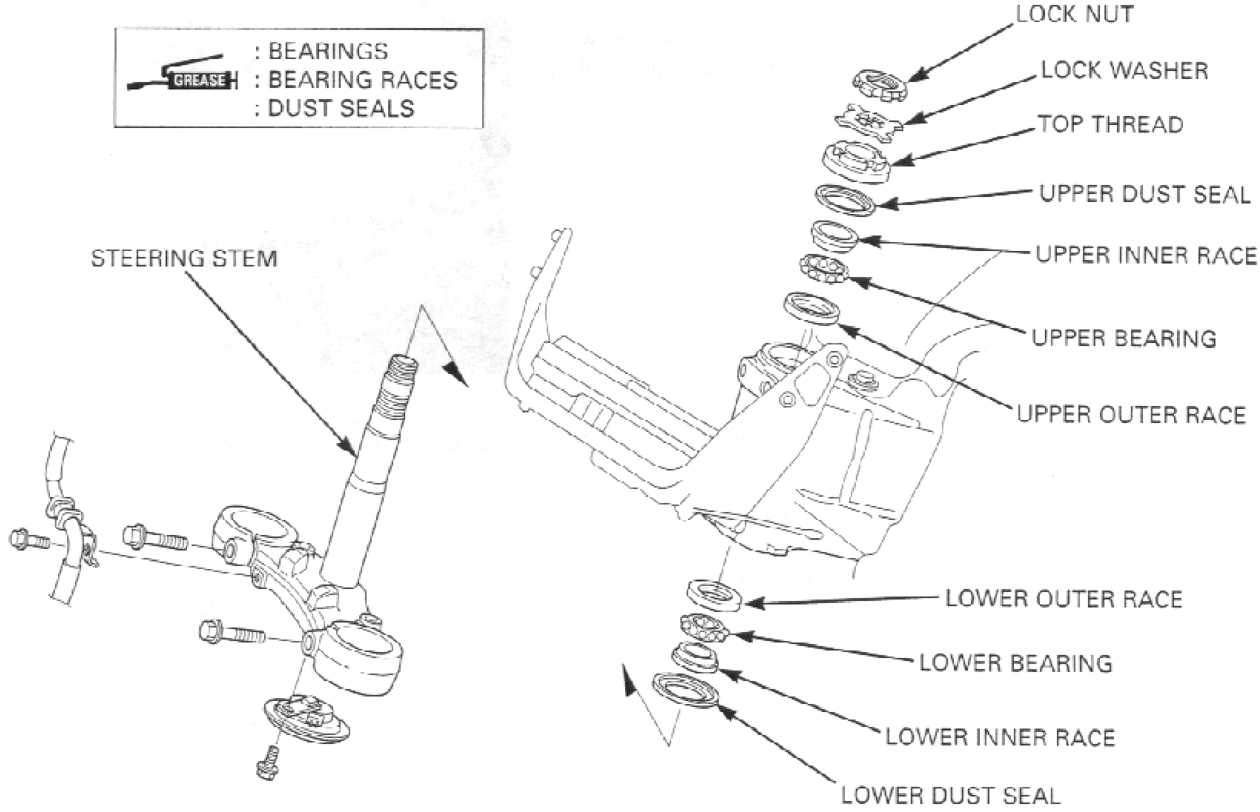
Apply grease to a new dust seal lips and install it over the steering stem.
Install a new lower bearing inner race using the special tool and a hydraulic press.

TOOL:
Steering stem driver 07946–MB00000



INSTALLATION

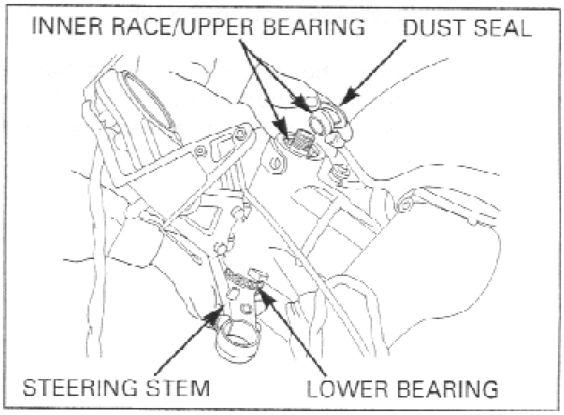
GREASE : BEARINGS
: BEARING RACES
: DUST SEALS



Apply grease to the upper and lower bearings and bearing races.

Install the lower bearing onto the steering stem.
Insert the steering stem into the steering head pipe.

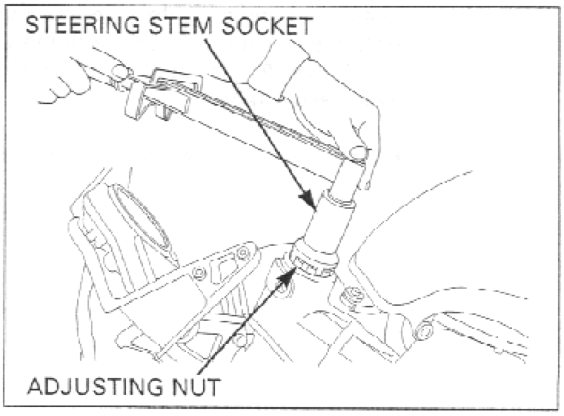
Install upper bearing, inner race and dust seal.



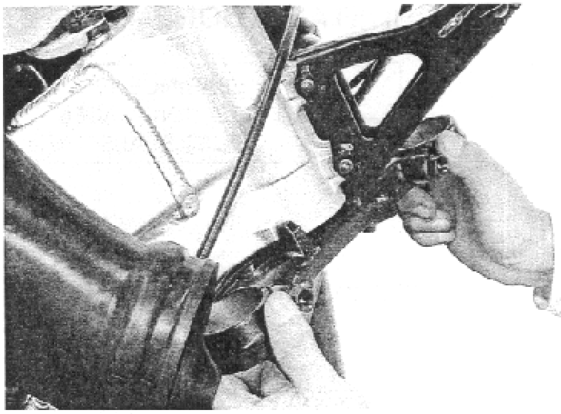
Apply oil to the bearing adjustment nut threads.
Install and tighten the stem bearing adjusting nut to the initial torque.

TOOL:
Steering stem socket **07916–3710101**

TORQUE: 25 N•m (2.5 kgf•m, 18 lbf•ft)



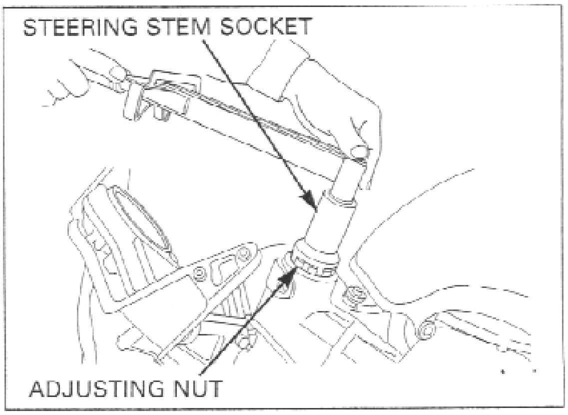
Move the steering stem to the right and left, lock-to-lock, five times to seat the bearings.
Make sure the steering stem moves smoothly, without play or binding; then loosen the bearing adjusting nut.



Retighten the bearing adjusting nut to the specified torque.

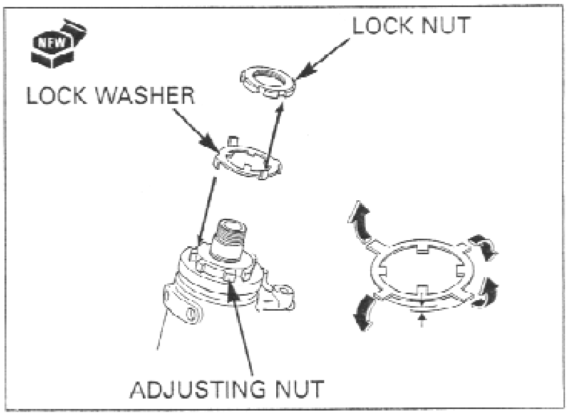
TORQUE: 25 N·m (2.5 kgf·m, 18 lbf·ft)

Recheck that the steering stem moves smoothly without play or binding.



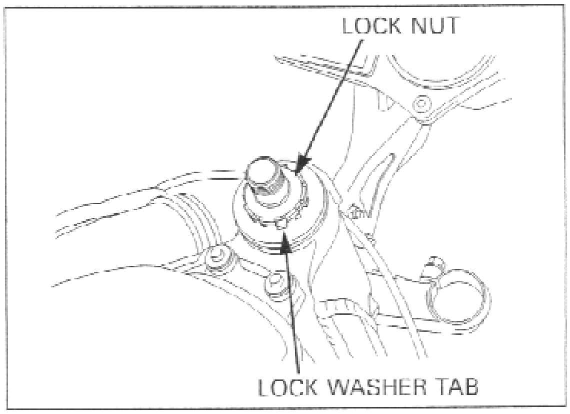
Install the new lock washer onto the steering stem.

Align the tabs of the lock washer with the grooves in the adjustment nut and bend the two opposite tabs (shorter) down into the adjustment nut groove.



Install and finger tighten the lock nut.
Hold the lock nut and further tighten the lock nut within 1/4 turn (90°), enough to align its grooves with the lock washer tabs.

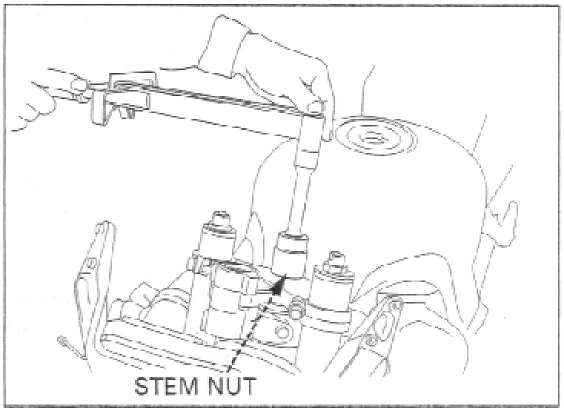
Bend the lock washer tabs up into the lock nut groove.



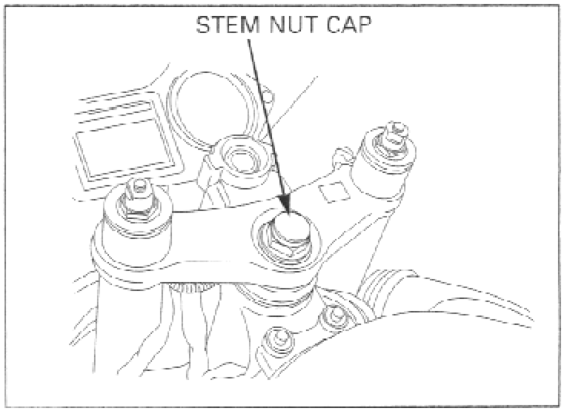
Install the fork legs (page 13-23).

Install the top bridge and steering stem nut.
Tighten the steering stem nut to the specified torque.

TORQUE: 103 N•m (10.5 kgf•m, 76 lbf•ft)



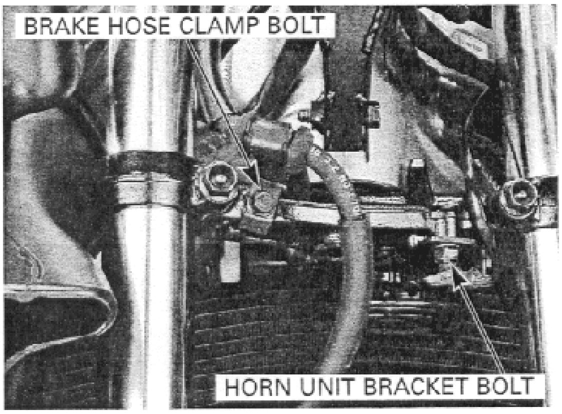
Install the steering stem nut cap.



Install the front brake hose clamp, tighten the bolt to the specified torque.

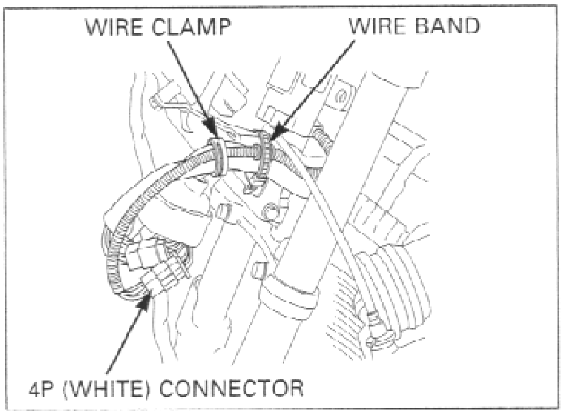
TORQUE: 10 N•m (1.0 kgf•m, 7 lbf•ft)

Install the horn unit assembly and tighten the mounting bolt.
Connect the horn wire connectors.



Connect the ignition switch 4P (White) connector and secure the wires with the wire band and clamp (page 1-23).

Install the following:
- Front wheel (page 13-13)
- Handlebar (page 13-5)
- Upper cowl (page 2-9)



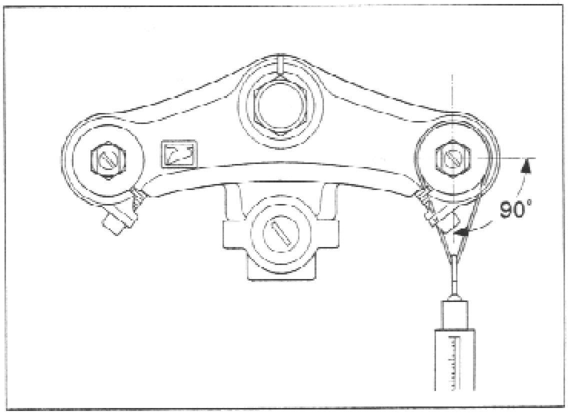
STEERING HEAD BEARING PRE-LOAD

Support the motorcycle so the front wheel is off the ground.

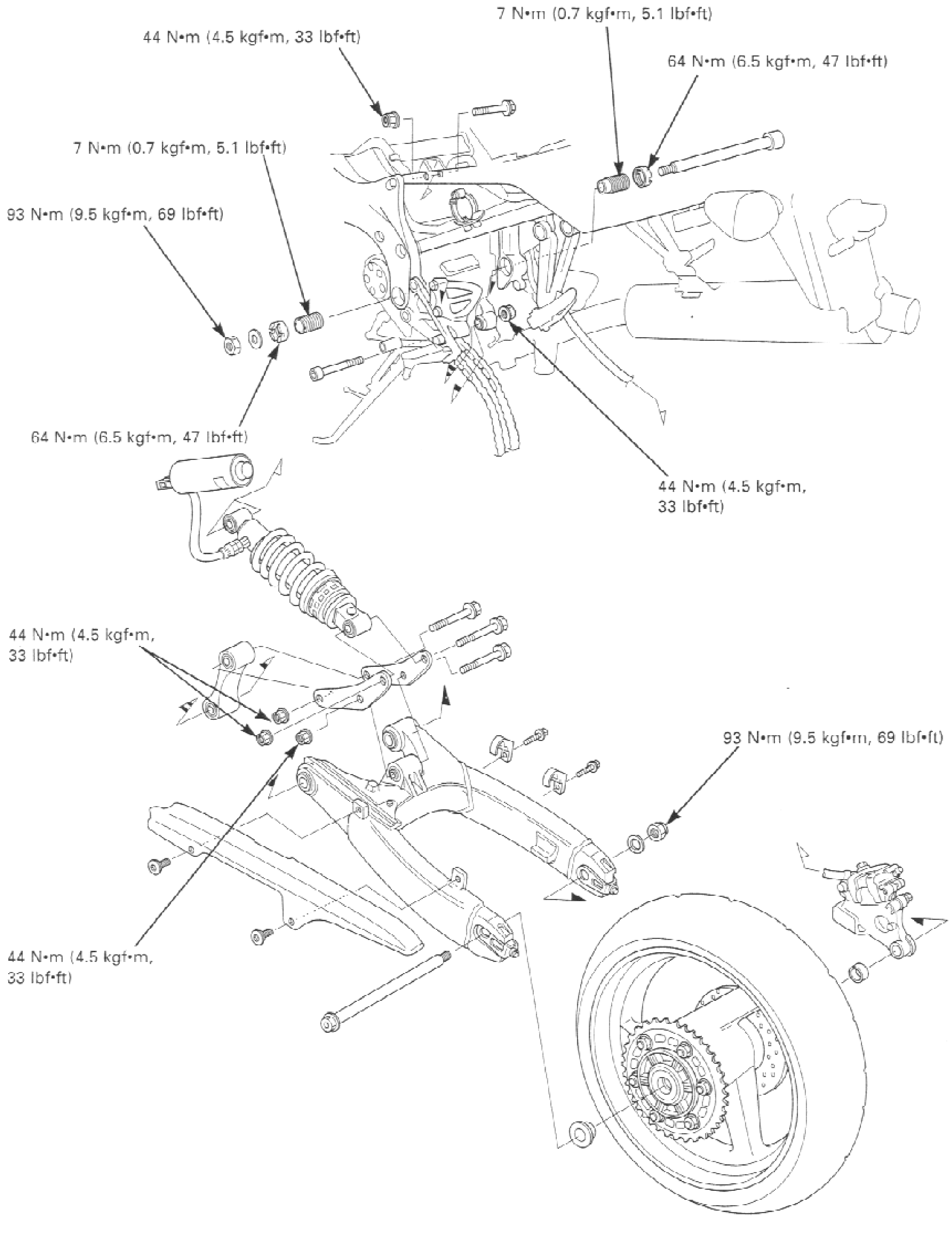
Position the steering stem straight ahead.
Hook a spring scale to the fork tube and measure the steering head bearing pre-load.

Make sure there is no cable or wire harness interference.

The pre-load should be within 1.0 – 1.5 kgf (2.2 – 3.3 lbf).
If the readings do not fall within the limits, lower the front wheel to the ground and adjust the steering bearing adjusting nut.



MEMO



7 N•m (0.7 kgf•m, 5.1 lbf•ft)
44 N•m (4.5 kgf•m, 33 lbf•ft)
64 N•m (6.5 kgf•m, 47 lbf•ft)
7 N•m (0.7 kgf•m, 5.1 lbf•ft)
93 N•m (9.5 kgf•m, 69 lbf•ft)
64 N•m (6.5 kgf•m, 47 lbf•ft)
44 N•m (4.5 kgf•m,
33 lbf•ft)
44 N•m (4.5 kgf•m,
33 lbf•ft)
93 N•m (9.5 kgf•m, 69 lbf•ft)
44 N•m (4.5 kgf•m,
33 lbf•ft)

SERVICE INFORMATION

GENERAL

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.
- After the rear wheel installation, check brake operation by applying the brake pedal.
- The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber.
- Before disposal of the shock absorber, release the nitrogen (page 14-13).
- When servicing the rear wheel and suspension, support the motorcycle using a safety stand or hoist.
- Use only tires marked "TUBELESS" and tubeless valves on rims marked "TUBELESS TIRE APPLICABLE".
- Use genuine Honda replacement bolts and nuts for all suspension pivot and mounting point.
- When using the lock nut wrench for the adjusting bolt lock nut, use a 20 inches long deflecting beam type torque wrench. The lock nut wrench increases the torque wrench's leverage, so the torque wrench reading will be less than the torque actually applied to the lock nut. The specification later in the text gives both actual and indicated.
- When installing the swingarm, be sure to tighten the swingarm pivot fasteners to the specified torque in the specified sequence. If you make a mistake during the tightening torque or sequence, loosen all pivot fasteners, then tighten them again to the specified torque in the correct sequence.
- Refer to section 15 for brake system information.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Minimum tire tread depth			—	2.0 (0.08)
Cold tire pressure	Up to 90 kg (200 lb) load		290 kPa (2.90 kgf/cm², 42 psi)	—
	Up to maximum weight capacity		290 kPa (2.90 kgf/cm², 42 psi)	—
Axle runout			—	0.2 (0.01)
Wheel rim runout	Radial		—	2.0 (0.08)
	Axial		—	2.0 (0.08)
Wheel balance weight			—	60 g (2.1 oz) max.
Drive chain	Size/link	DID	DID525HV–108LE	—
		RK	RKGB525ROZ1–108LE	—
	Slack		25 – 35 (1 – 1-3/8)	—
Shock absorber	Spring adjuster standard position		Position 3	—
	Rebound adjuster initial setting		1-1/2 turns out from full hard	—
	Compression adjuster initial setting		1-1/2 turns out from full hard	—

TORQUE VALUES

Rear brake disc bolt	42 N•m (4.3 kgf•m, 31 lbf•ft)	ALOC bolt: replace with a new one.
Final driven sprocket nut	64 N•m (6.5 kgf•m, 47 lbf•ft)	U-nut.
Rear axle nut	93 N•m (9.5 kgf•m, 69 lbf•ft)	U-nut.
Rear shock absorber mounting nut	44 N•m (4.5 kgf•m, 33 lbf•ft)	U-nut.
Shock link plate-to-swingarm nut	44 N•m (4.5 kgf•m, 33 lbf•ft)	U-nut.
Shock link-to-shock link plate nut	44 N•m (4.5 kgf•m, 33 lbf•ft)	U-nut.
Shock link-to-bracket nut	44 N•m (4.5 kgf•m, 33 lbf•ft)	U-nut.
Drive chain slider flange bolt	9 N•m (0.9 kgf•m, 6.5 lbf•ft)	ALOC bolt: replace with a new one.
Swingarm pivot adjusting bolt	7 N•m (0.7 kgf•m, 5.1 lbf•ft)	See page 14-22.
Swingarm pivot adjusting bolt lock nut	64 N•m (6.5 kgf•m, 47 lbf•ft)	
Swingarm pivot nut	93 N•m (9.5 kgf•m, 69 lbf•ft)	U-nut.

TOOLS

Bearing remover shaft	07746–0050100
Bearing remover head, 20 mm	07746–0050600
Driver	07749–0010000
Driver head	07946–MJ00200
Attachment, 32 x 35 mm	07746–0010100
Attachment, 37 x 40 mm	07746–0010200
Attachment, 42 x 47 mm	07746–0010300
Attachment, 52 x 55 mm	07746–0010400
Attachment, 24 x 26 mm	07746–0010700
Attachment, 22 x 24 mm	07746–0010800
Pilot, 17 mm	07746–0040400
Pilot, 20 mm	07746–0040500
Pilot, 25 mm	07746–0040600
Pilot, 28 mm	07746–0041100
Attachment, 28 x 30 mm	07946–1870100
Lock nut wrench	07908–4690003
Bearing remover handle	07936–3710100
Bearing remover head	07936–3710600
Remover weight	07741–0010201
Driver	07949–3710001 or 07946–MJ00100
Attachment, 34 mm	07ZMD–MBW0100
Attachment, 37 mm	07ZMD–MBW0200
Bearing remover set	07LMC–KV30100

TROUBLESHOOTING

Soft suspension
- Weak shock absorber spring
- Incorrect suspension adjustment
- Oil leakage from damper unit
- Insufficient tire pressure

Hard suspension
- Incorrect suspension adjustment
- Damaged rear suspension pivot bearings
- Bent damper rod
- Incorrect swingarm pivot fasteners tightening
- Tire pressure too high

Rear wheel wobbles
- Bent rim
- Worn or damaged rear wheel bearings
- Faulty rear tire
- Unbalanced rear tire and wheel
- Insufficient rear tire pressure
- Faulty swingarm pivot bearings

Rear wheel turns hard
- Faulty rear wheel bearings
- Bent rear axle
- Rear brake drag
- Drive chain too tight

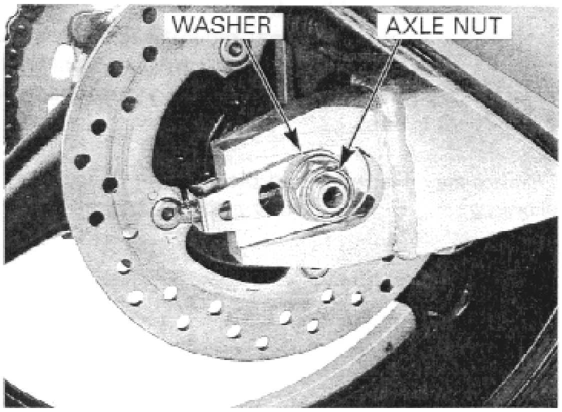
Rear suspension noise
- Faulty rear shock absorber
- Loose rear suspension fasteners
- Worn rear suspension pivot bearings

REAR WHEEL

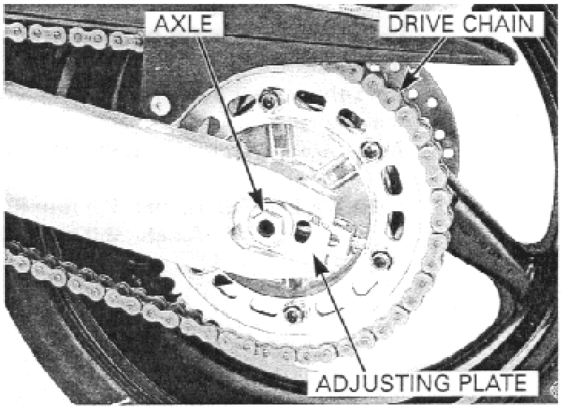
REMOVAL

Support the motorcycle using a safety stand or a hoist, so the rear wheel is off the ground.

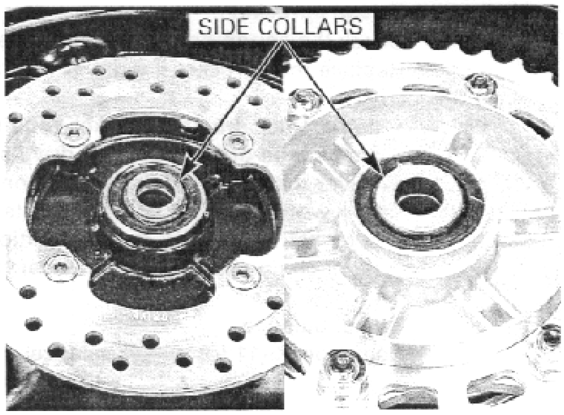
Remove the axle nut and washer.



Remove the rear axle.
Remove the drive chain from the driven sprocket, then remove the rear wheel.



Remove the side collars.

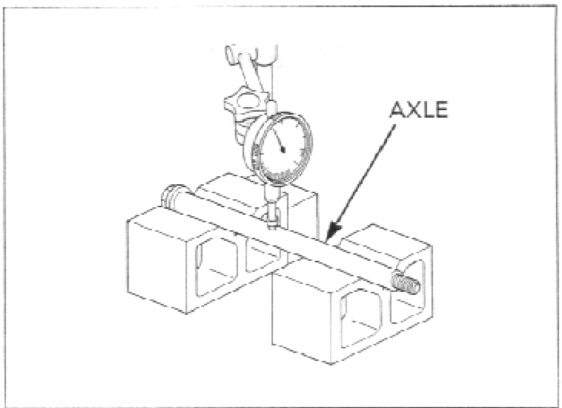


INSPECTION

Axle

Place the axle in V-blocks and measure the runout.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)

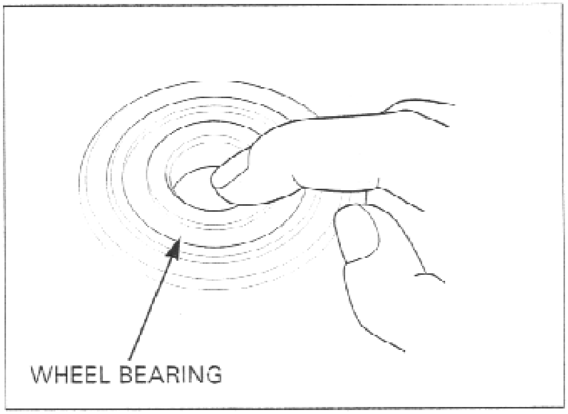


Wheel bearing

Turn the inner race of each bearing with your finger. Bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Replace the wheel bearings in pairs.

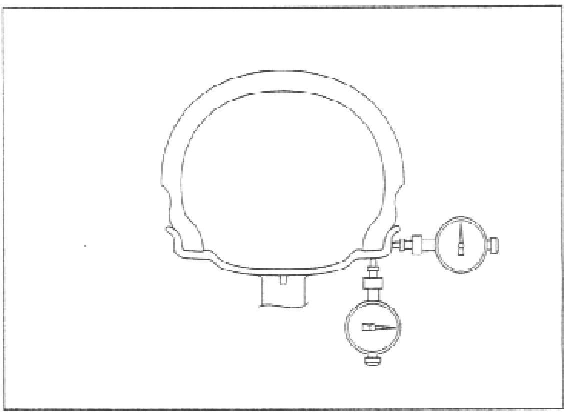
Remove and discard the bearings if the races do not turn smoothly and quietly, or if they fit loosely in the hub.



Wheel rim runout

Check the rim runout by placing the wheel in a trueing stand.
Spin the wheel slowly and read the runout using a dial indicator.
Actual runout is 1/2 the total indicator reading.

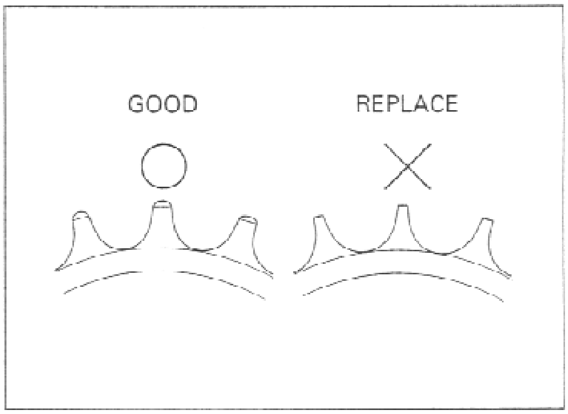
SERVICE LIMITS: Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)



Driven sprocket

Check the condition of the final driven sprocket teeth. Replace the sprocket if worn or damaged.

- If the final driven sprocket requires replacement, inspect the drive chain and drive sprocket.
- Never install a new drive chain on a worn sprocket or a worn chain on new sprockets. Both chain and sprocket must be in good condition or the replacement chain or sprocket will wear rapidly.

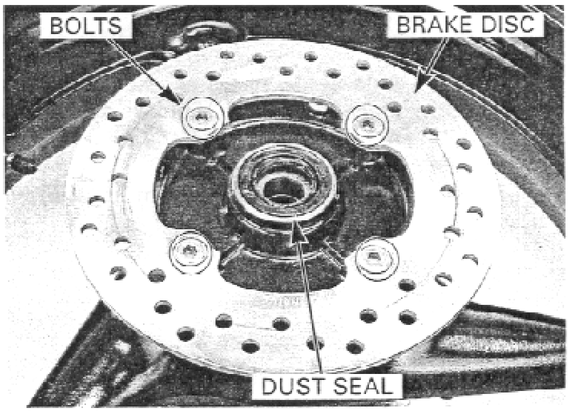


Wheel balance

See page 13-11 for wheel balance.

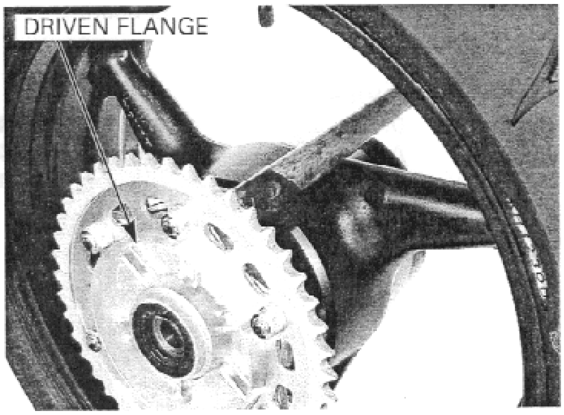
DISASSEMBLY

Remove the bolts and brake disc.
Remove the right dust seal.

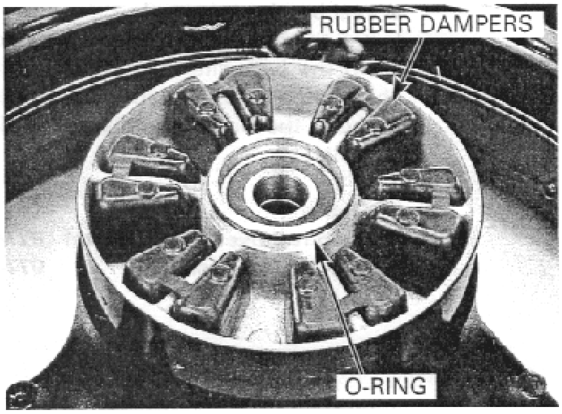


If you disassemble the driven flange, loosen the driven sprocket nuts before removing the driven flange from the wheel hub.

Remove the driven flange assembly from the left wheel hub.



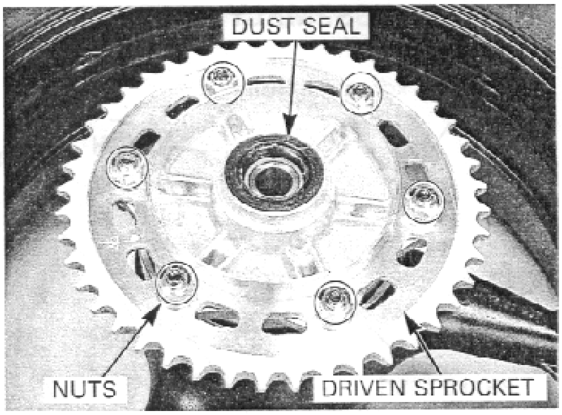
Remove the wheel rubber dampers.
Remove the O-ring.



Driven flange bearing removal
Loosen the driven sprocket nuts.

Remove the driven flange from the wheel hub, then remove the driven sprocket nuts and sprocket.

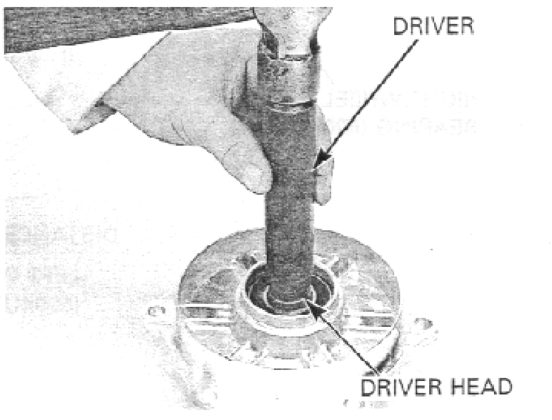
Remove the dust seal.



Drive the driven flange collar out from the driven flange bearing.

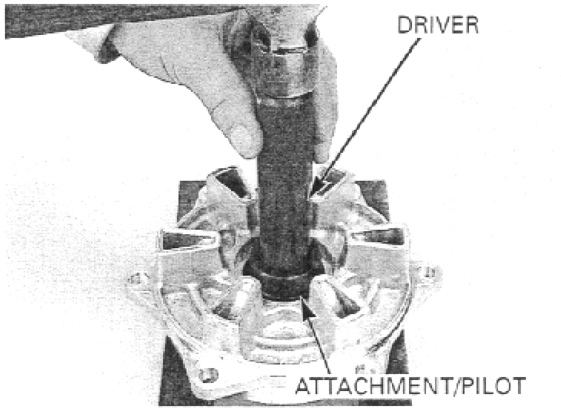
TOOLS:

Driver	**07749–0010000**
Attachment, 24 x 26 mm	**07746–0010700**
Pilot, 20 mm	**07746–0040500**



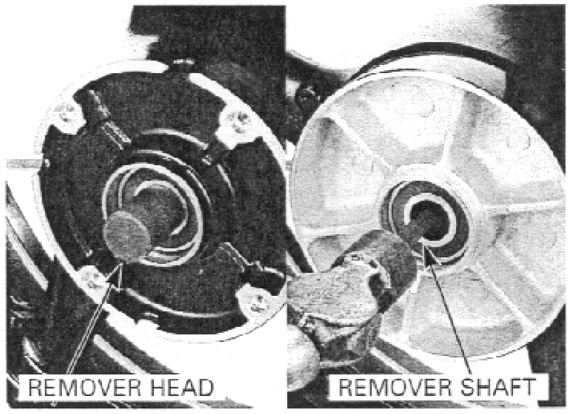
Drive the driven flange bearing out using the special tools.

TOOLS:
Driver 07749–0010000
Attachment, 37 x 40 mm 07746–0010200
Pilot, 25 mm 07746–0040600

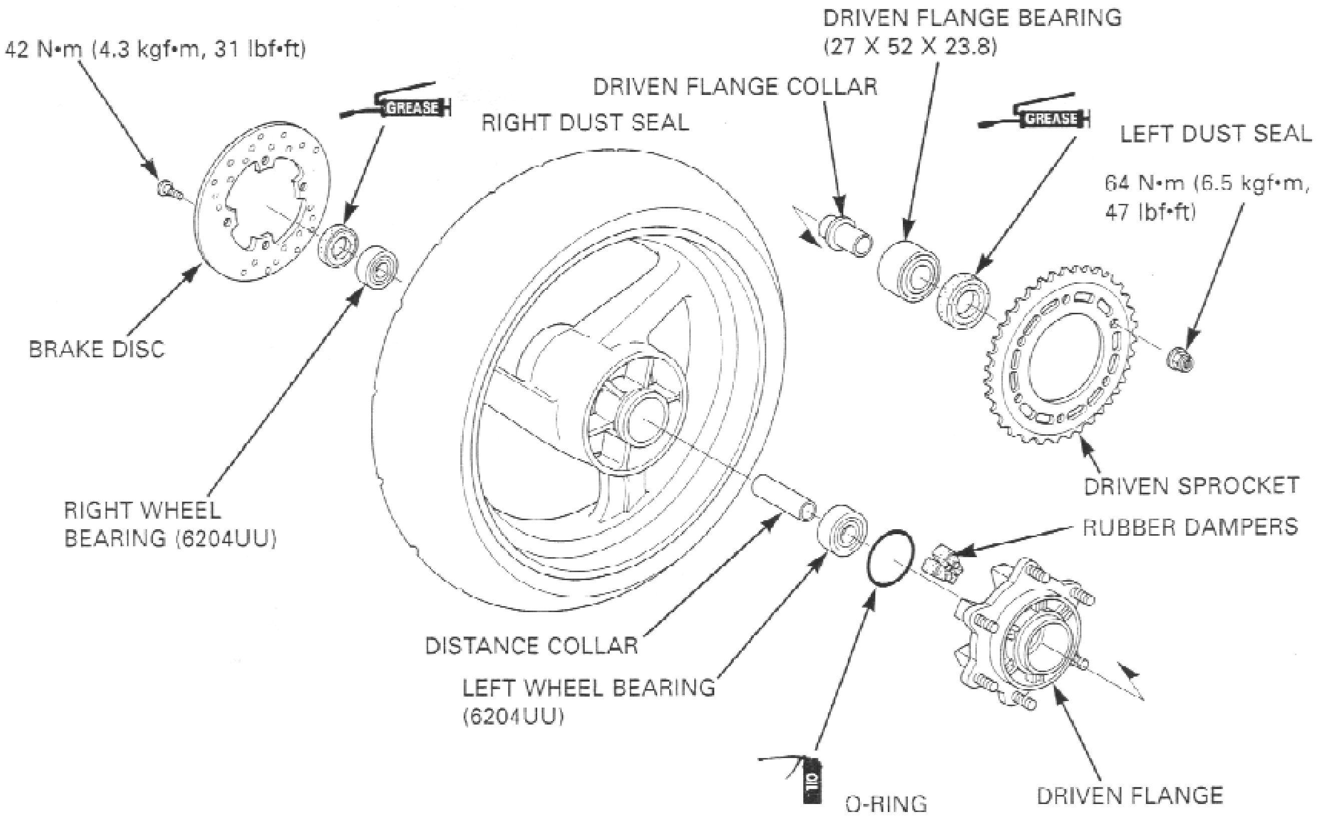


Wheel bearing removal
Install the bearing remover head into the bearing.
From the opposite side install the bearing remover shaft and drive the bearing out of the wheel hub.
Remove the distance collar and drive out the other bearing.

TOOLS:
Bearing remover head, 20 mm 07746–0050600
Bearing remover shaft 07746–0050100



ASSEMBLY



Never install the old bearings. Once the bearings have been removed, the bearing must be replaced with new ones.

Wheel bearing installation

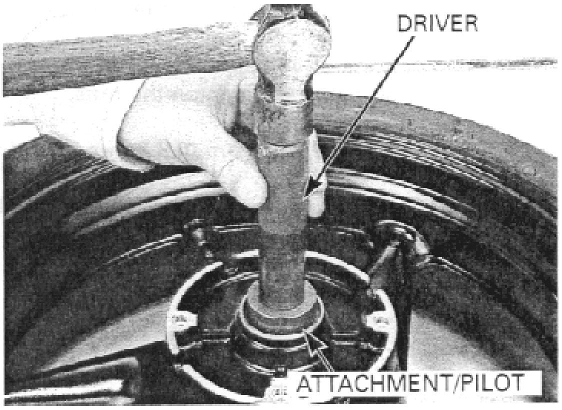
Drive in a new right bearing squarely.

TOOLS:

Driver	**07749–0010000**
Attachment, 42 x 47 mm	**07746–0010300**
Pilot, 20 mm	**07746–0040500**

Install the distance collar

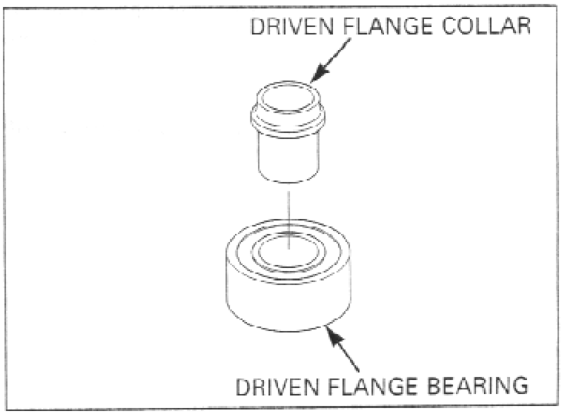
Drive in the left side bearing using the same tools.



Press the driven flange collar in the new driven flange bearing until it is fully seated.

TOOLS:

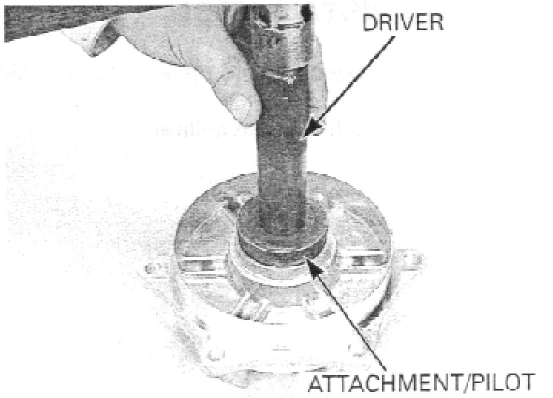
Driver	**07749–0010000**
Attachment, 28 x 30 mm	**07746–1870100**
Pilot, 20 mm	**07746–0040500**



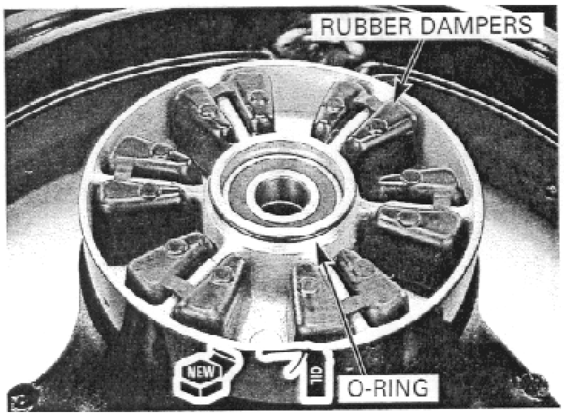
Driven flange bearing installation
Drive the new driven flange bearing into the driven flange using the special tools.

TOOLS:

Driver	**07749–0010000**
Attachment, 52 x 55 mm	**07746–0010400**
Pilot, 20 mm	**07746–0040500**



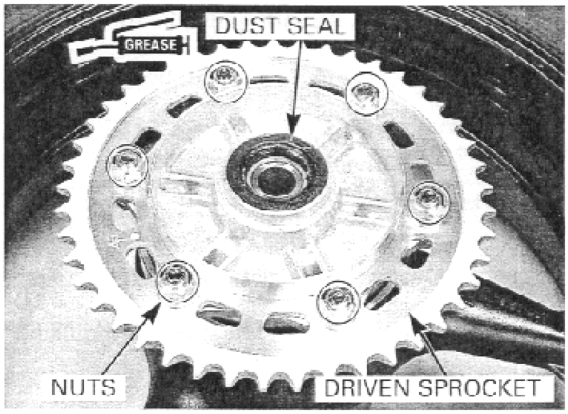
Install the wheel rubber dampers into the wheel hub. Apply oil to the new O-ring and install it into the groove of the wheel hub.



Install the driven flange assembly into the left wheel hub.
If the driven sprocket was removed, install the driven sprocket and tighten the nuts.

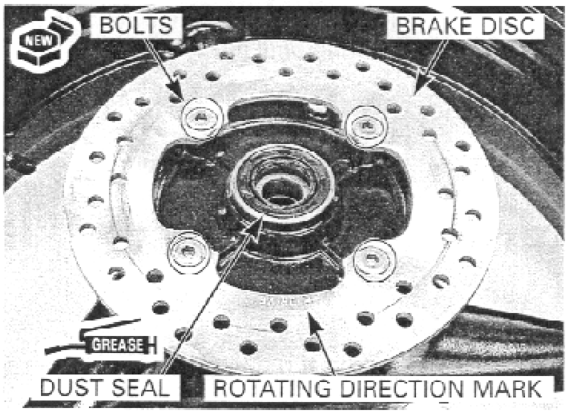
TORQUE: 64 N·m (6.5 kgf·m, 47 lbf·ft)

Apply grease to the dust seal lips, then install it into the driven flange.



Install the brake disc with the mark facing out.
Install and tighten the new bolts to the specified torque.

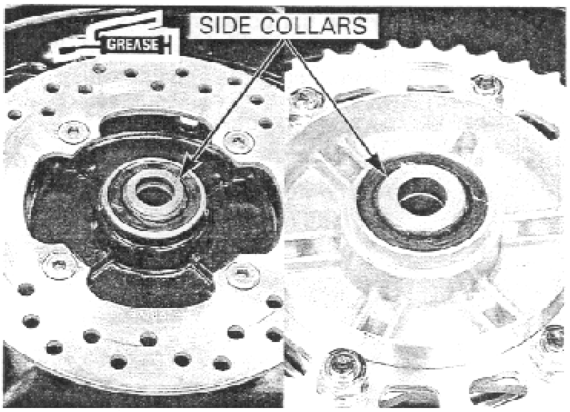
TORQUE: 42 N·m (4.3 kgf·m, 31 lbf·ft)



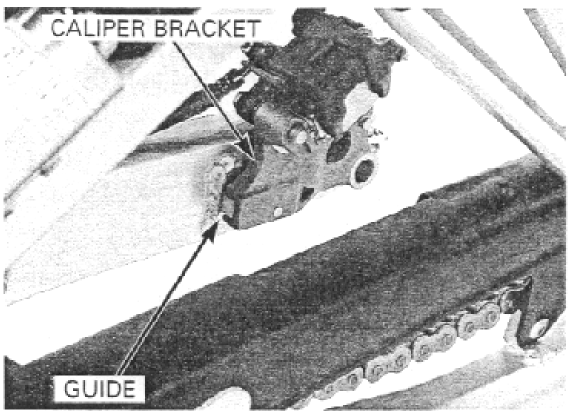
INSTALLATION

Apply grease to the side collar inside and grooves.

Install the side collars.

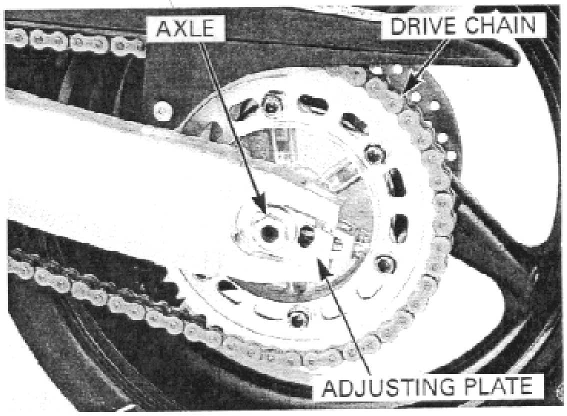


Install the rear brake caliper bracket onto the guide of the swingarm.



Be careful not to damage the brake pads.

Place the rear wheel into the swingarm.
Install the drive chain over the driven sprocket.
Install the rear axle from the left side.

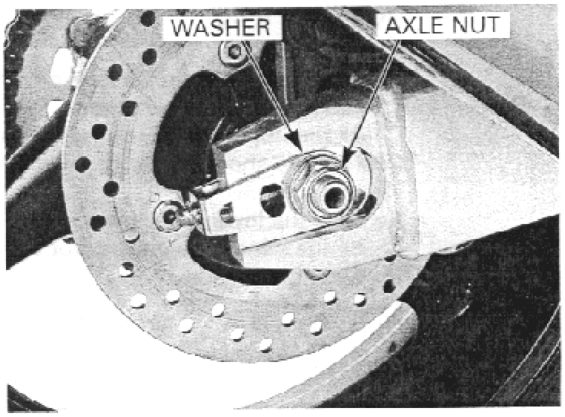


Install the washer and axle nut.

Adjust the drive chain slack (page 3-19).

Tighten the axle nut to the specified torque.

TORQUE: 93 N·m (9.5 kgf·m, 69 lbf·ft)



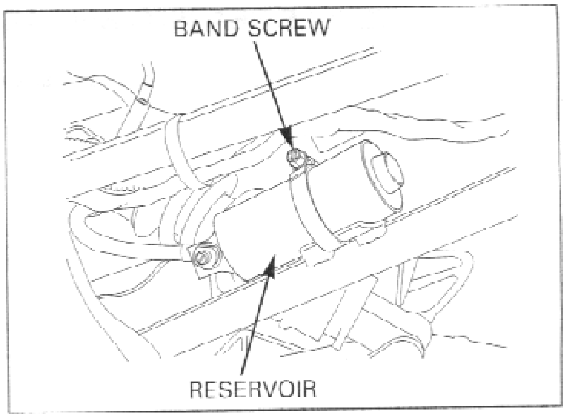
SHOCK ABSORBER

REMOVAL

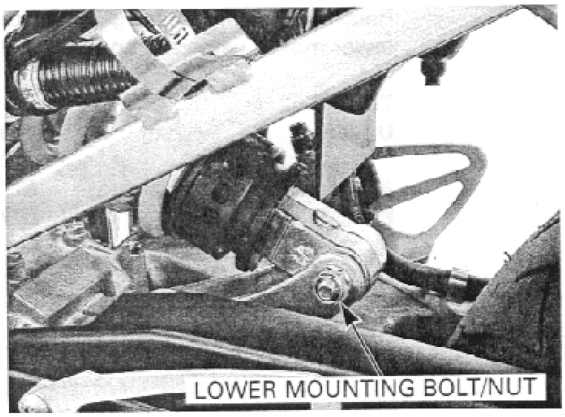
Remove the seat (page 2-2).

Support the motorcycle using a hoist or an equivalent.

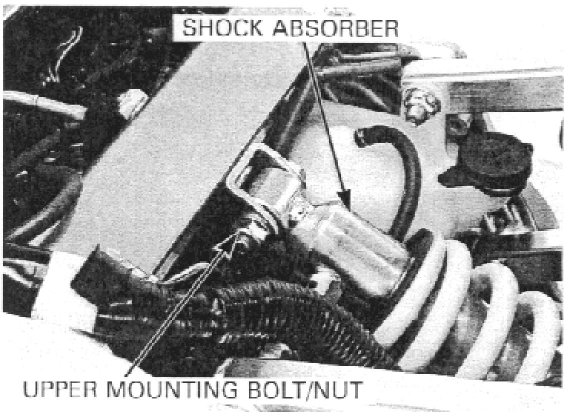
Loosen the shock absorber reservoir band screw and remove the reservoir from the seat rail.



Remove the shock absorber lower mounting bolt/nut.



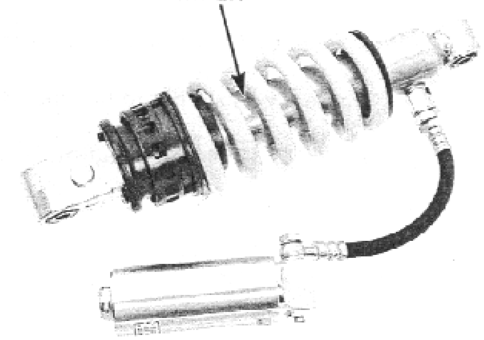
Remove the shock absorber upper mounting bolt/nut and the shock absorber.



INSPECTION

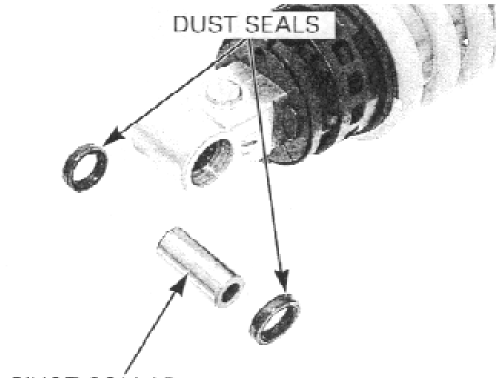
Check the damper unit, reservoir hose and reservoir for leakage or other damage.
Check the upper joint bushing for wear or damage.
Replace the shock absorber assembly if necessary.

Remove the lower joint pivot collar.
Check the needle bearing, pivot collar and dust seals for wear or damage.



NEEDLE BEARING REPLACEMENT

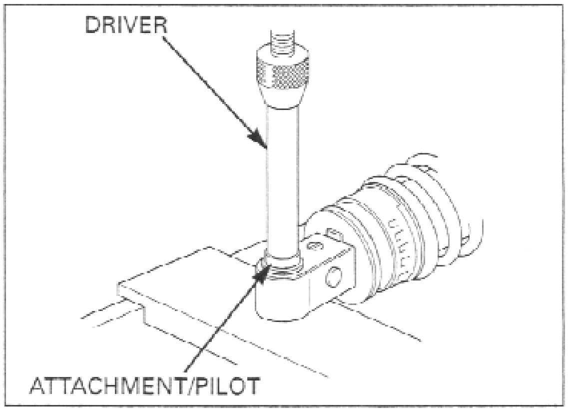
Remove the pivot collar and dust seals.



Press the needle bearing out of the shock absorber lower mount using the special tools.

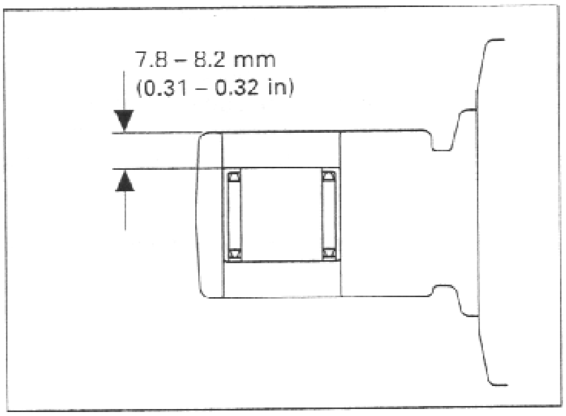
TOOLS:

Driver	**04949-3710001 or**
	07946-MJ00100
Attachment, 22 x 24 mm	**07746-0010800**
Pilot, 17 mm	**07746-0040400**

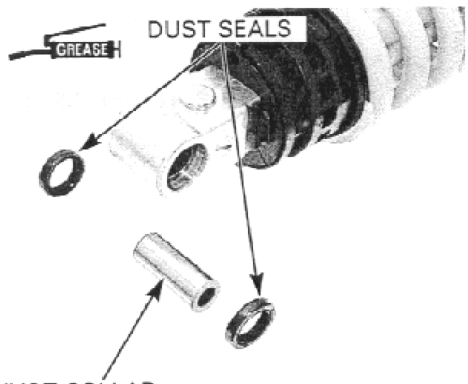


Press the needle bearing into the lower mount with the marked side facing out.

Press a new needle bearing into the lower mount so the needle bearing surface is 7.8 – 8.2 mm (0.31 – 0.32 in) lower from the end of the lower mount using the same tools.



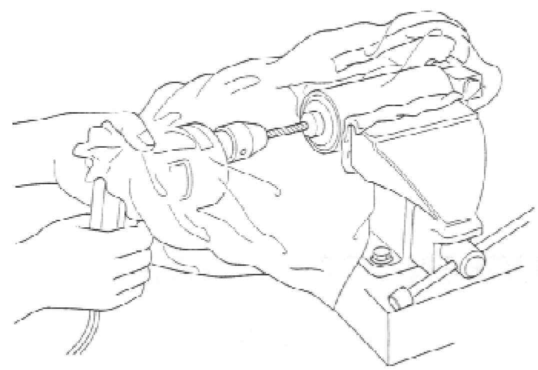
Apply grease to the new dust seal lips and install them into the lower mount.
Install the pivot collar.



SHOCK ABSORBER DISPOSAL PROCEDURE

Center punch the reservoir tank end to mark the drilling point.

Wrap the damper unit inside a plastic bag.
Support the reservoir tank in a vise as shown.
Through the open end of the bag, insert a drill motor with a sharp 2 – 3 mm (5/64 – 1/8 in) drill bit.



NOTICE

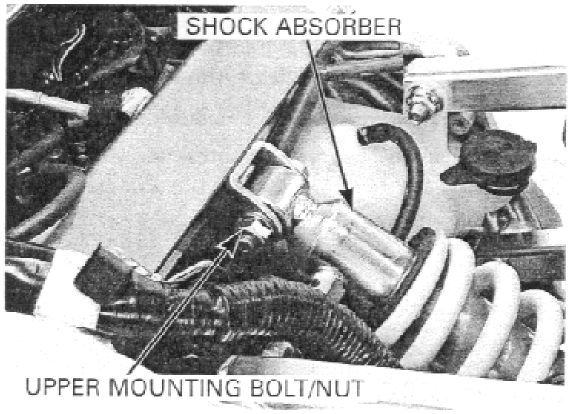
- *Do not use a dull drill bit which could cause a build-up of excessive heat and pressure inside the damper, leading to explosion and severe personal injury.*
- *The shock absorber contains nitrogen gas and oil under high pressure. Do not drill any farther down the damper case than the measurement given above, or you may drill into the oil chamber; oil escaping under high pressure may cause serious personal injury.*
- *Always wear eye protection to avoid getting metal shaving in your eye when the gas pressure is released. The plastic bag is only intended to shield you from the escaping gas.*

Hold the bag around the drill motor and briefly run the drill motor inside the bag; this will inflate the bag with air from the motor and help keep the bag from getting caught in the bit when your start.

INSTALLATION

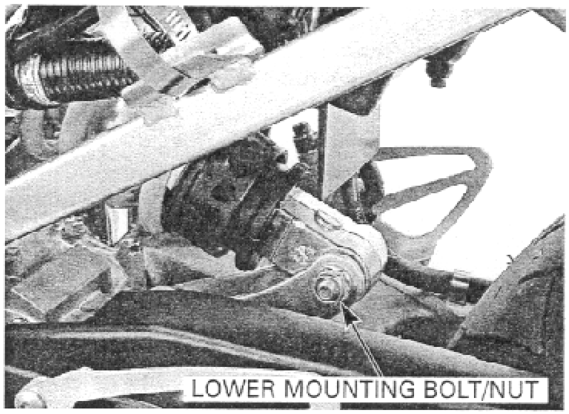
Install the shock absorber into the frame with the reserve tank outlet facing to the left.
Install the upper and lower mounting bolt/nut.
Tighten the upper mounting nut to the specified torque.

TORQUE: 44 N•m (4.5 kgf•m, 33 lbf•ft)



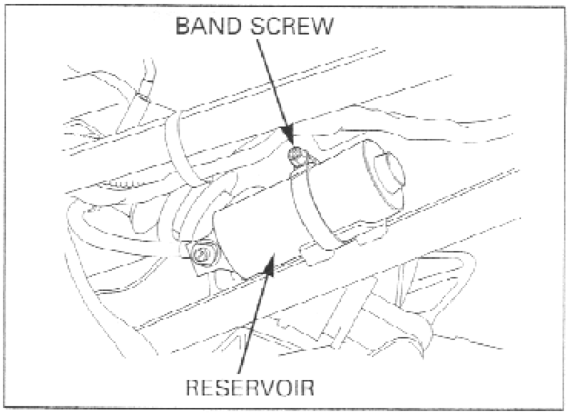
Tighten the lower mounting nut to the specified torque.

TORQUE: 44 N•m (4.5 kgf•m, 33 lbf•ft)



Install the reservoir into the reservoir band.
Tighten the band screw securely.

Install the removed parts in the reverse order of removal.

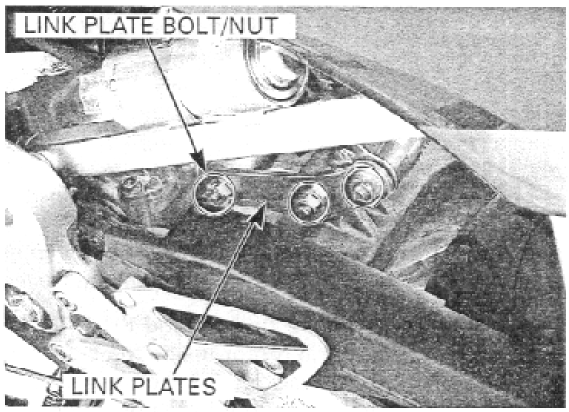


SUSPENSION LINKAGE

REMOVAL

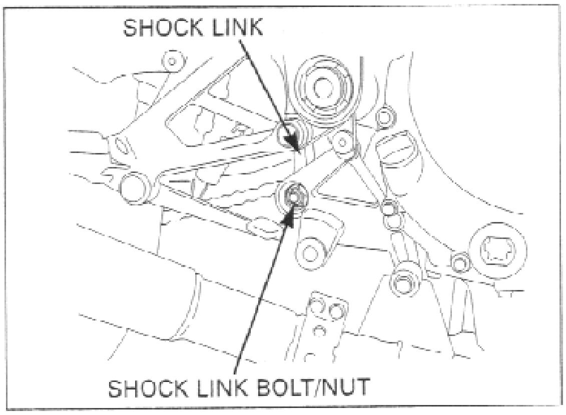
Support the motorcycle using a hoist or equivalent.

Remove the following:
- Shock absorber lower mounting bolt/nut
- Shock link plate-to-swingarm bolt/nut
- Shock link plate-to-shock link bolt/nut
- Shock link plates



If the shock link cannot be removed, support the motorcycle securely with a hoist or equivalent and loosen the shock link bracket nuts to get the clearance between the shock link and brackets (page 7-4).

- Shock link-to-bracket bolt/nut
- Shock link

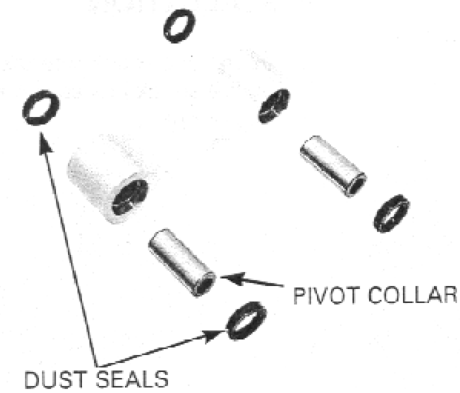


INSPECTION

Check that the suspension linkage components for damage, replace any damaged components.

SHOCK LINK BEARING REPLACEMENT

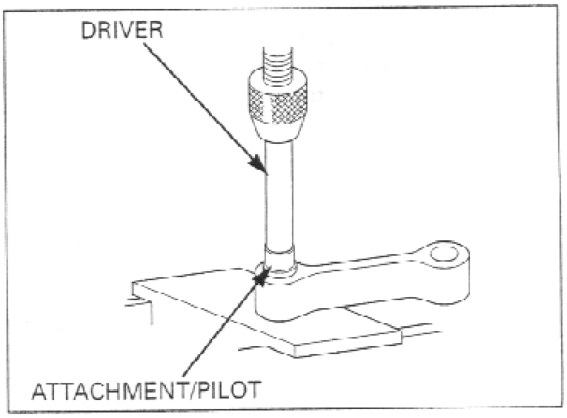
Remove the pivot collar and dust seals.



Press the needle bearing out of the shock link using the special tools.

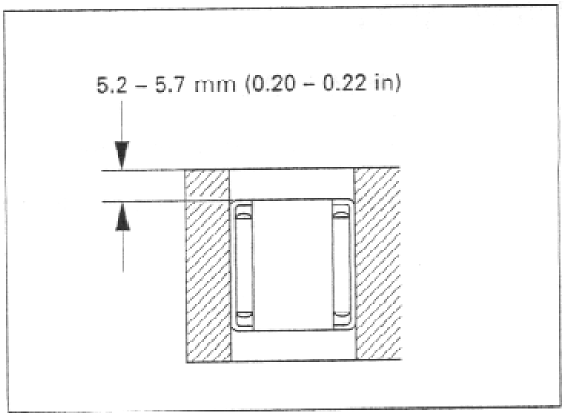
TOOLS:

Driver	**04949-3710001 or 07946-MJ00100**
Attachment, 22 x 24 mm	**07746-0010800**
Pilot, 17 mm	**07746-0040400**

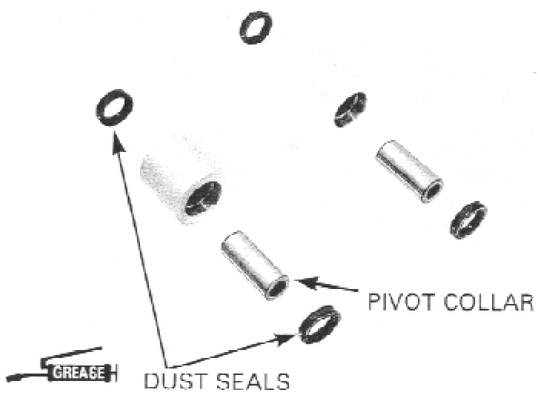


Press the needle bearing into the shock link with the marked side facing out.

Press a new needle bearing into the shock link so the needle bearing surface is 5.2 – 5.7 mm (0.20 – 0.22 in) lower from the end of the shock link using the same tools.

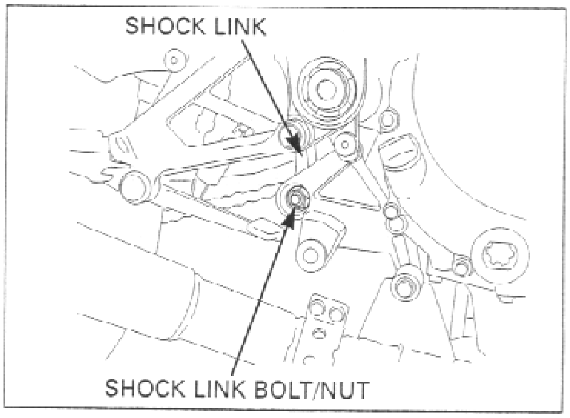


Apply grease to the new dust seal lips and install them into the shock link.
Install the pivot collar.



INSTALLATION

Install the shock link into the link brackets.
Install the shock link socket bolt from the left side.
Install the nut.

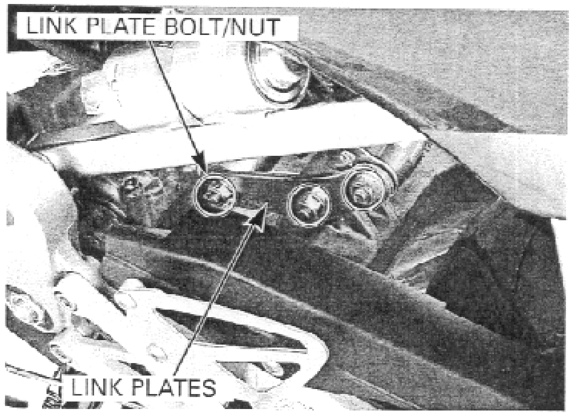


Install the shock link plates with the arrow facing the left and front side.
Install the shock link plate bolt from the right side.
Install the nut.

Tighten the link bracket nuts if they were loosened (page 7-17).

Tighten the suspension linkage nuts to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

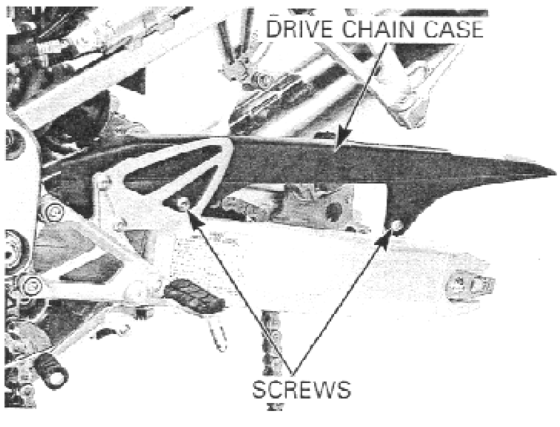


SWINGARM

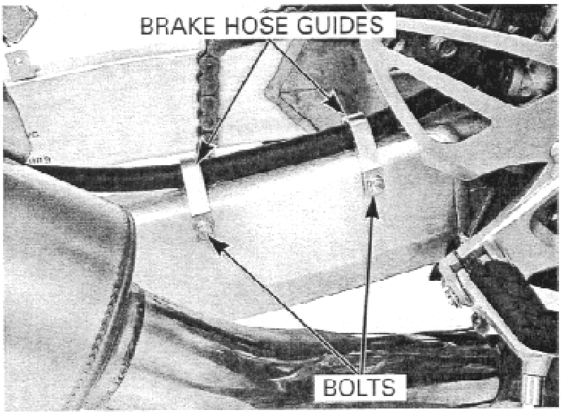
REMOVAL

Remove the rear wheel (page 14-3)

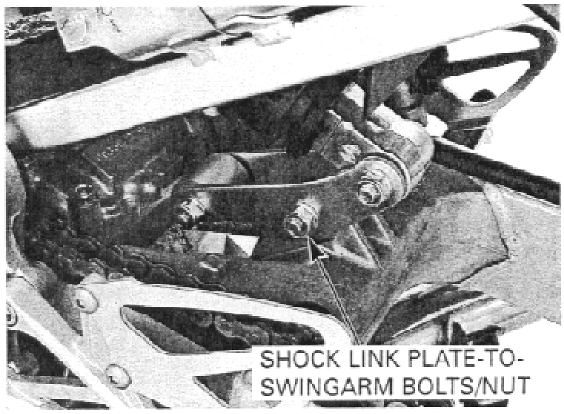
Remove the two screws and drive chain case.



Remove the bolts and brake hose guides.

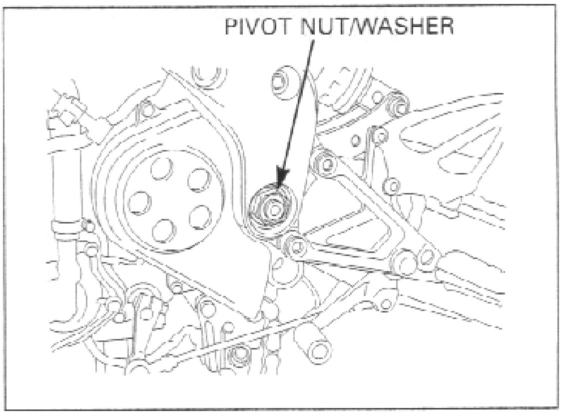


Remove the shock link plate-to-swingarm bolt/nut.



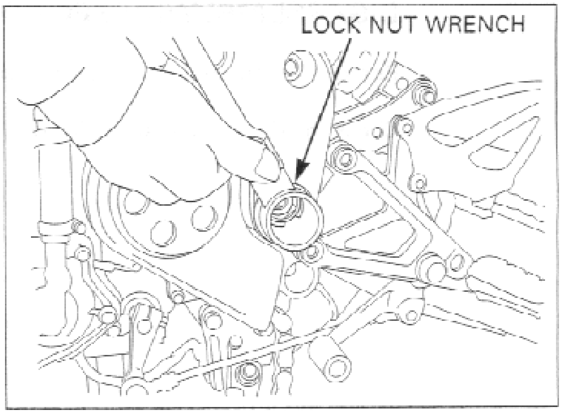
Remove the swingarm pivot nut and washer.

Remove the swingarm pivot bolt.



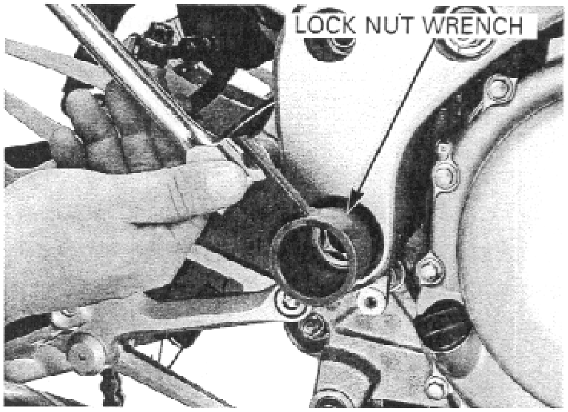
Loosen the left pivot adjusting bolt lock nut using the special tool.

TOOL:
Lock nut wrench **07908–4690003**

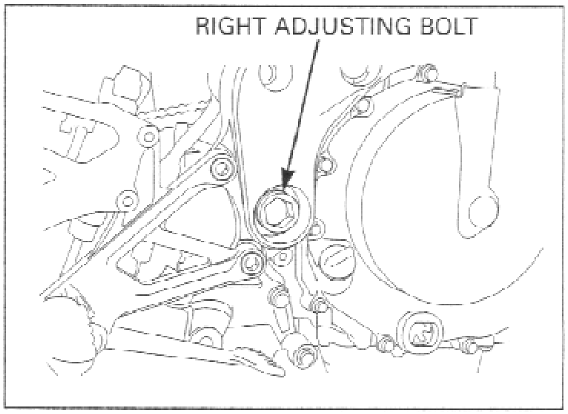


Loosen the right pivot adjusting bolt lock nut using the special tool.

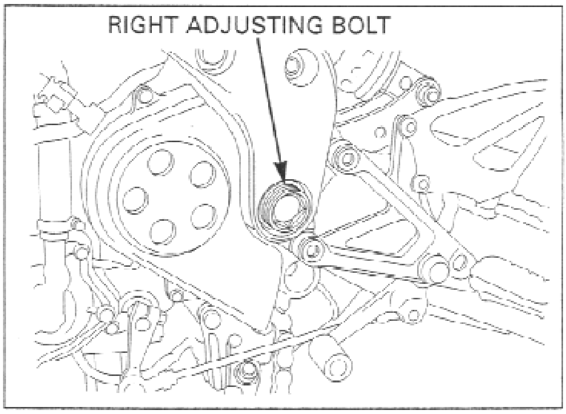
TOOL:
Lock nut wrench 07908–4690003



Loosen the right pivot adjusting bolt.



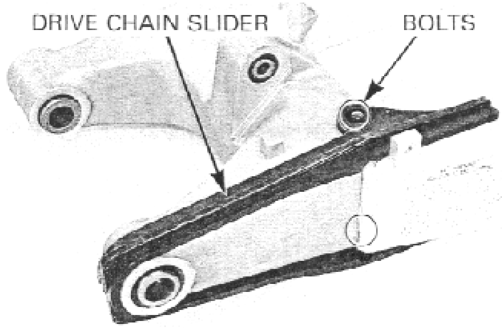
Loosen the left pivot adjusting bolt, then remove the swingarm.



DISASSEMBLY/INSPECTION

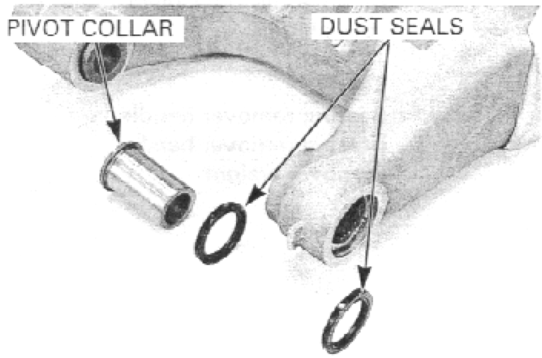
Remove the three SH bolts and drive chain slider.

Check the drive chain slider for wear or damage.



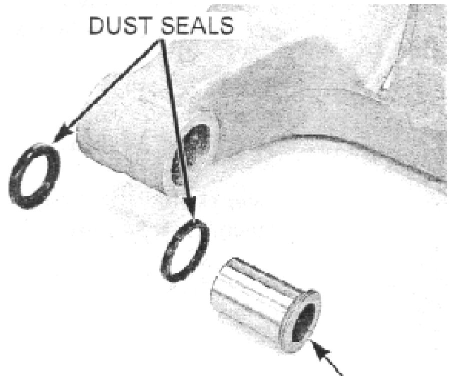
Remove the pivot collar and dust seals from the left swingarm pivot.

Check the dust seals and collars for damage or fatigue.



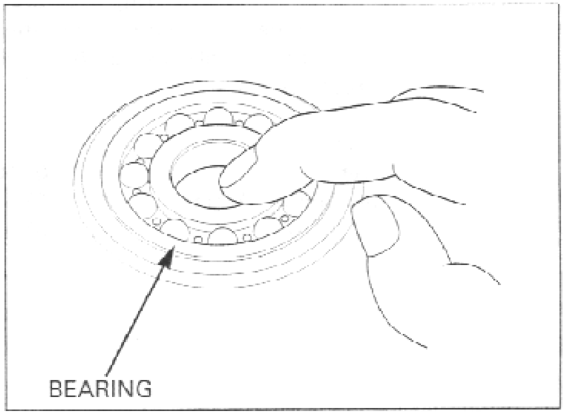
Remove the pivot distance collar and dust seals from the swingarm right pivot.

Check the dust seals and collars for damage or fatigue.



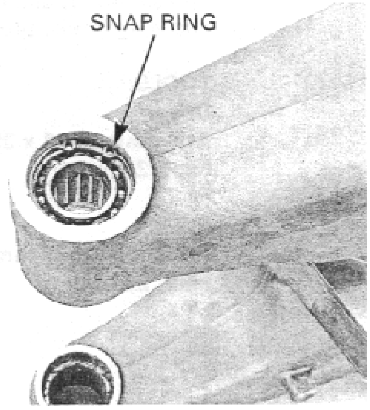
Turn the inner race of the right pivot bearings with your finger.
The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the swingarm pivot.

Remove and discard the bearings if the races do not turn smoothly and quietly, or if they fit loosely in the swingarm pivot.



PIVOT BEARING REPLACEMENT

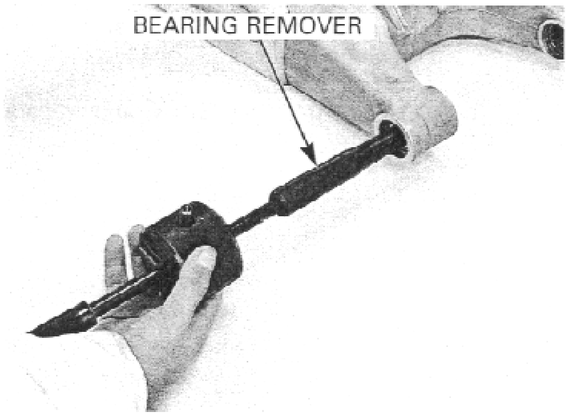
Remove the snap ring.



Remove the right pivot radial ball bearing using the special tools.

TOOLS:

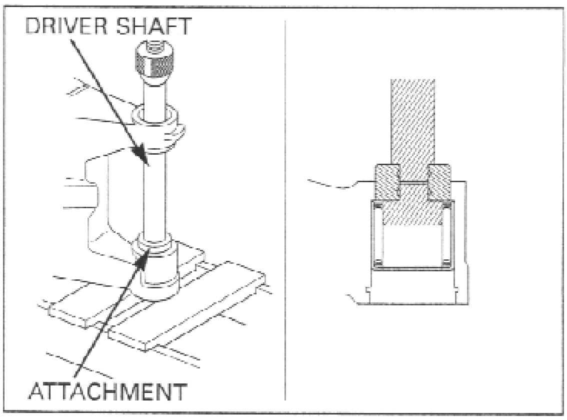
Bearing remover handle	**07936–3710100**
Bearing remover head	**07936–3710600**
Remover weight	**07741–0010201**



Press the right pivot needle bearing out using the special tools and a hydraulic press.

TOOLS:

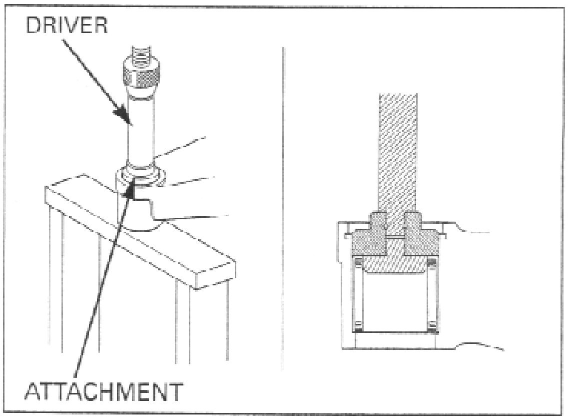
Driver	**07949–3710001**
Attachment, 34 mm	**07ZMD–MBW0100**
or	
Driver shaft	**07946–MJ00100**
Attachment, 34 mm	**07ZMD–MBW0100**



Pack a new needle bearing with grease.
Press the needle bearing into the right swingarm pivot until it seats using the special tools and a hydraulic press.

TOOLS:

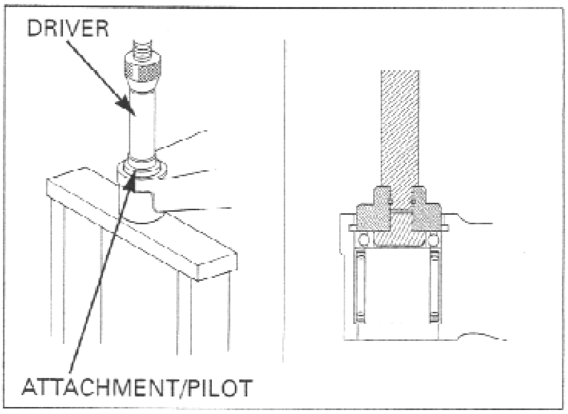
Driver	**07749–0010000**
Attachment, 37 mm	**07ZMD–MBW0200**
Pilot, 28 mm	**07746–0041100**



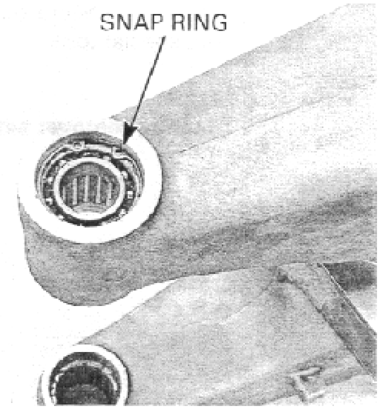
Press in the radial ball bearing using the special tools and a hydraulic press.

TOOLS:

Driver	**07749–0010000**
Attachment, 32 x 35 mm	**07746–0010100**
Pilot, 20 mm	**07746–0040500**
or	
Driver	**07749–0010000**
Attachment, 37 mm	**07ZMD–MBW0200**
Pilot, 20 mm	**07746–0040500**



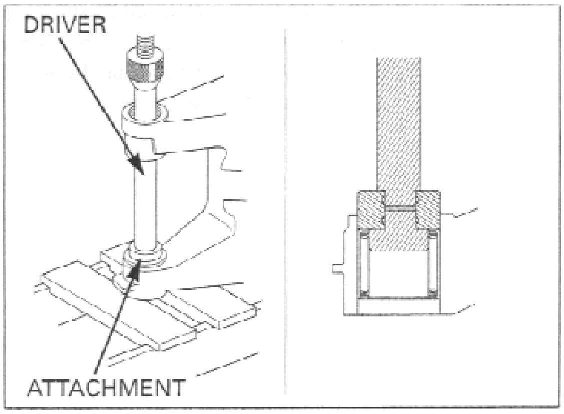
Install the snap ring into the groove securely.



Remove the left pivot needle bearing from the swingarm pivot using the special tools.

TOOLS:

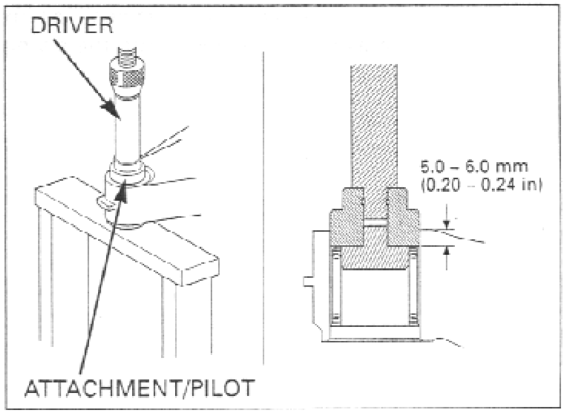
Driver	**07949-3710001**
Attachment, 37 mm	**07ZMD-MBW0200**
or	
Driver shaft	**07946-MJ00100**
Attachment, 37 mm	**07ZMD-MBW0200**
or	
Driver shaft	**07946-MJ00100**
Needle bearing remover	**07HMC-MR70100**



Press a new left pivot needle bearing into the swingarm pivot so the needle bearing surface is 5.0 – 6.0 mm (0.20 – 0.24 in) lower from the end of the swingarm pivot surface using the special tools and a hydraulic press.

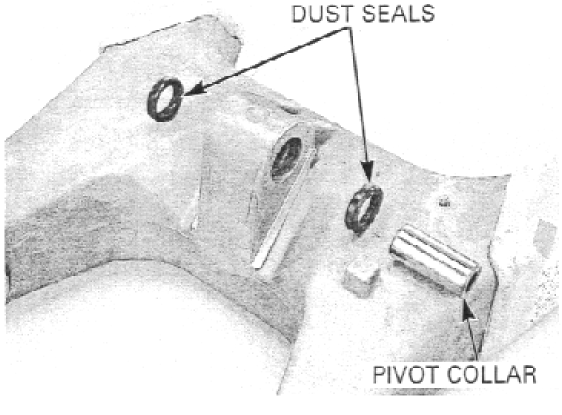
TOOLS:

Driver	**07749-0010000**
Attachment, 37 x 40 mm	**07746-0010200**
Pilot, 28 mm	**07746-0041100**
or	
Driver	**07749-0010000**
Attachment, 37 mm	**07ZMD-MBW0200**
Pilot, 28 mm	**07746-0041100**



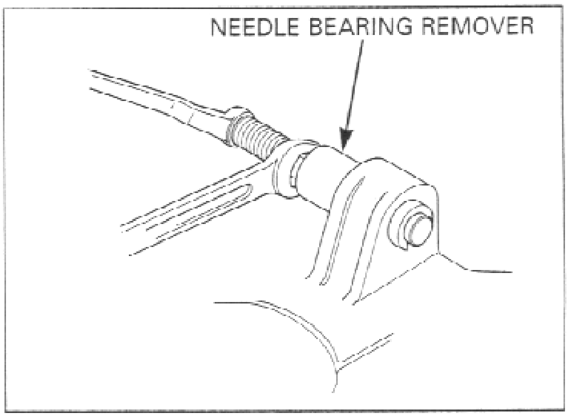
Shock link plate bearing replacement

Remove the pivot collar and dust seals from the shock link plate pivot of the swingarm.

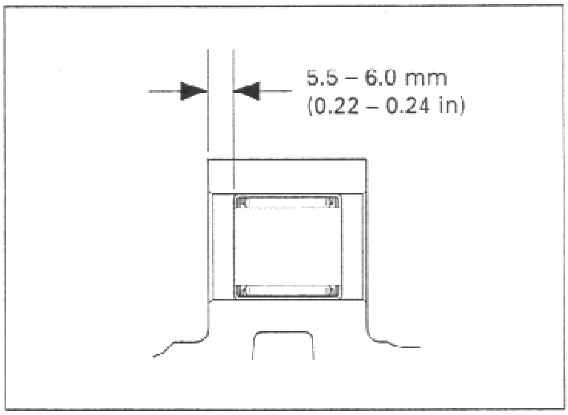


Draw the needle bearing out of the swingarm using the special tool.

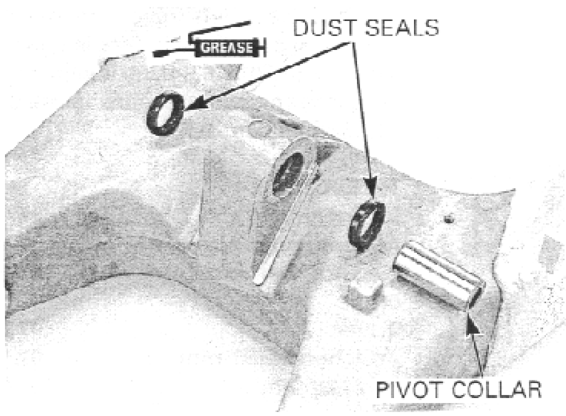
TOOL:
Bearing remover set **07LMC–KV30100**



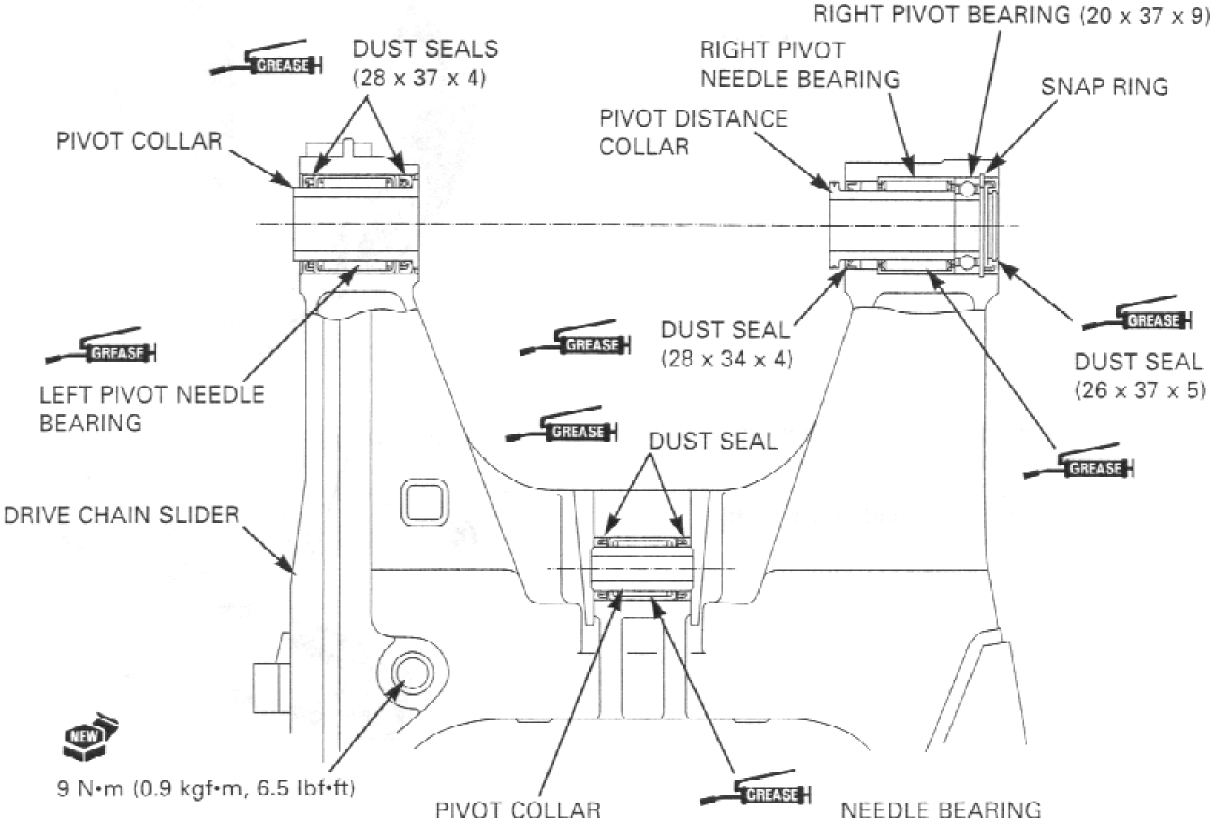
Apply grease to the needle rollers of the new bearing. Install the needle bearing into the pivot until the depth from the swingarm outer surface is 5.5 – 6.0 mm (0.22 – 0.24 in), using the same tool.



Apply grease to the dust seal lips, then install the dust seals and pivot collar into the swingarm.

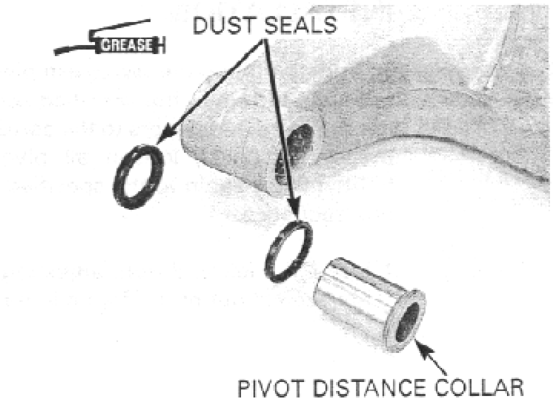


ASSEMBLY

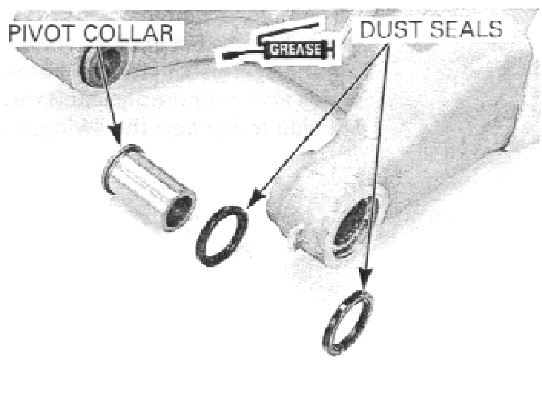


The right pivot distance collar has an identification groove on the flange.

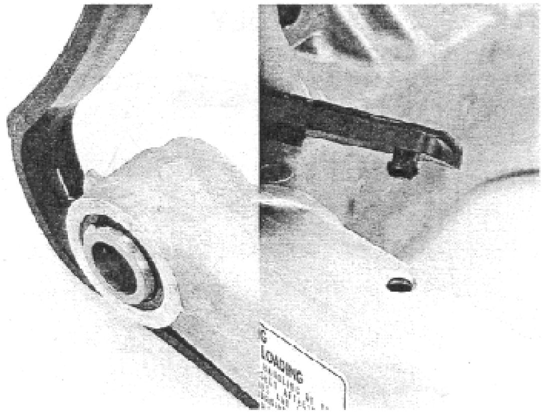
Apply grease to the dust seal lips, then install the dust seals into the right swingarm pivot.
Fill the grease up between the inner dust seal and needle bearing.
Install the pivot distance collar.



Apply grease to the dust seal lips, then install the dust seals and pivot collar into the left swingarm pivot.

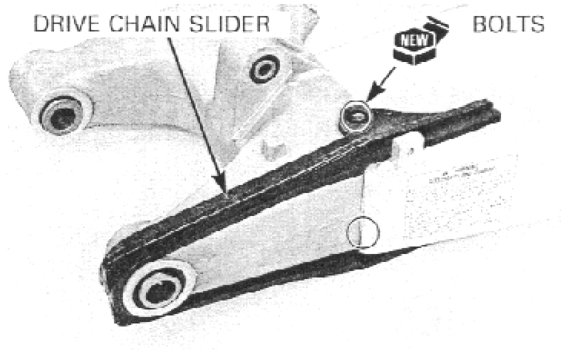


Install the drive chain slider aligning the slit with the boss on the swingarm.
Install the drive chain slider bosses into the hole in the swingarm.



Install and tighten the new drive chain slider mounting bolts to the specified torque

TORQUE: 9 N•m (0.9 kgf•m, 6.5 lbf•ft)

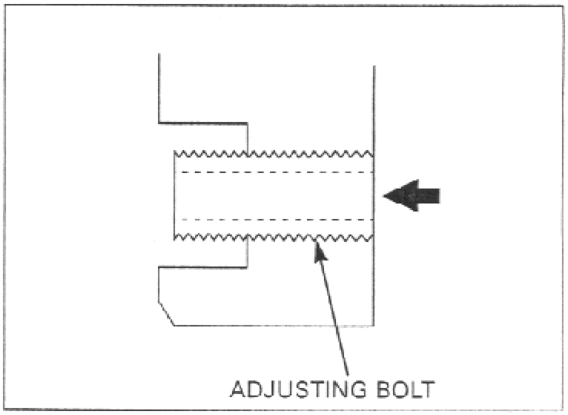


INSTALLATION

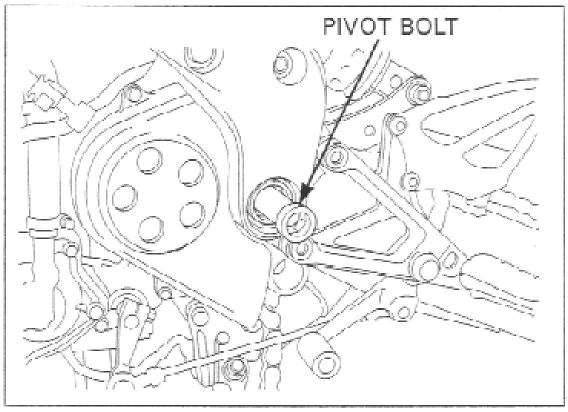
When tightening the lock nut with the lock nut wrench, refer to torque wrench reading information on page 14-1 "SERVICE INFORMATION".

Be sure to tighten the swingarm pivot fasteners to the specified torque in the specified sequence. If you do not tighten the fasteners to the correct torque or in the proper sequence, loosen all pivot fasteners, then tighten them again to the specified torque in the correct sequence.

1. Install the left and right adjusting bolts sot they do not project out of the frame inner surface.



2. Obtain a spare pivot bolt (P/N 52101-MBW-000) or use a 20 mm (0.8 in) O.D. shaft.
   Set the swingarm into the frame and the shock link plates and temporarily insert the pivot bolt from the left side to support the swingarm.

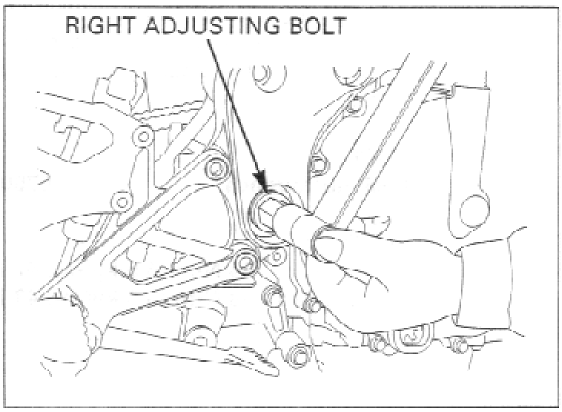


3. Tighten the right pivot adjusting bolt to the initial torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Loosen the right pivot adjusting bolt, and retighten it to the specified torque.

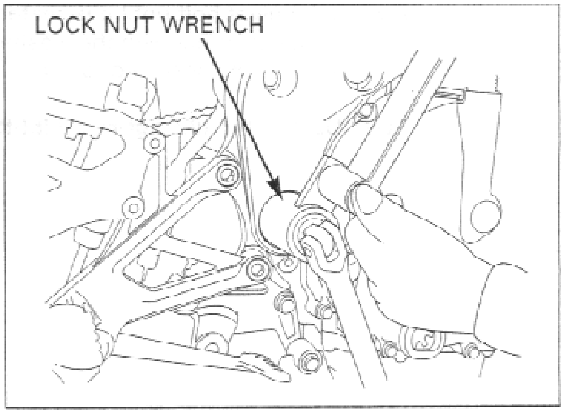
TORQUE: 7 N•m (0.7 kgf•m, 5.1 lbf•ft)



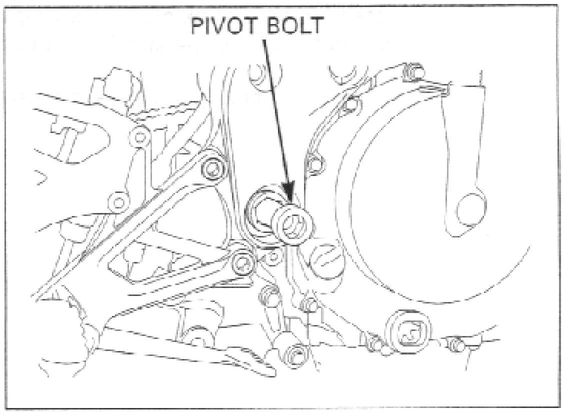
4. Install the right pivot lock nut.
Hold the right pivot adjusting bolt, then tighten the lock nut to the specified torque using the special tool.

TOOL:
Lock nut wrench 07908–4690003

TORQUE:
Actual: 64 N•m (6.5 kgf•m, 47 lbf•ft)
Indicated: 58 N•m (5.9 kgf•m, 43 lbf•ft)



5. Insert the other pivot bolt from the right side, gradually pushing the left side pivot bolt out from the left side.

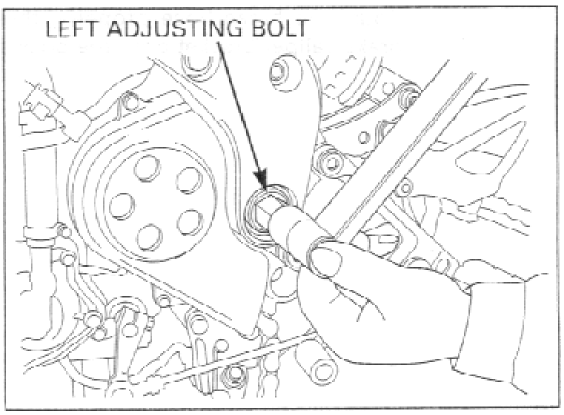


6. Tighten the left pivot adjusting bolt to the initial torque.

TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Loosen the left pivot adjusting bolt and retighten it to the specified torque.

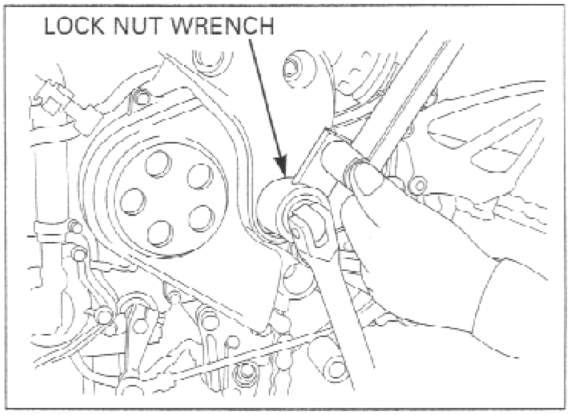
TORQUE: 7 N•m (0.7 kgf•m, 5.1 lbf•ft)



7. Install the left lock nut.
   Hold the left pivot adjusting bolt, then tighten the lock nut to the specified torque using the special tool.

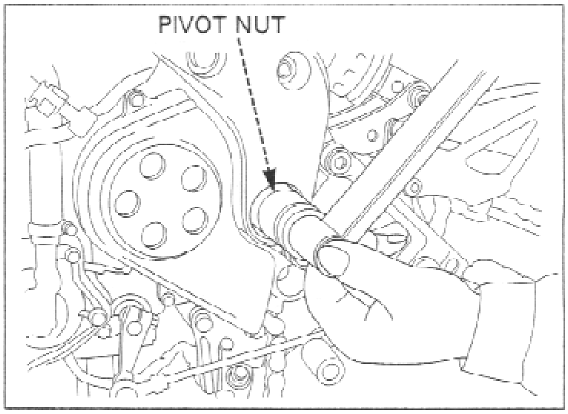
TOOL:
Lock nut wrench **07908–4690003**

TORQUE:
Actual: 64 N·m (6.5 kgf·m, 47 lbf·ft)
Indicated: 58 N·m (5.9 kgf·m, 43 lbf·ft)



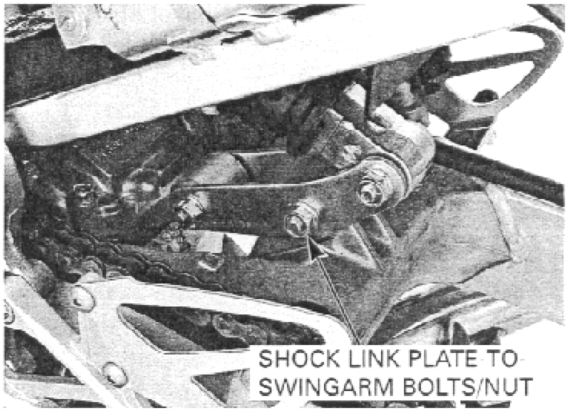
8. Push the pivot bolt until it is seated.
   Install the pivot nut with the washer and tighten the pivot nut to the specified torque.

TORQUE: 93 N·m (9.5 kgf·m, 69 lbf·ft)

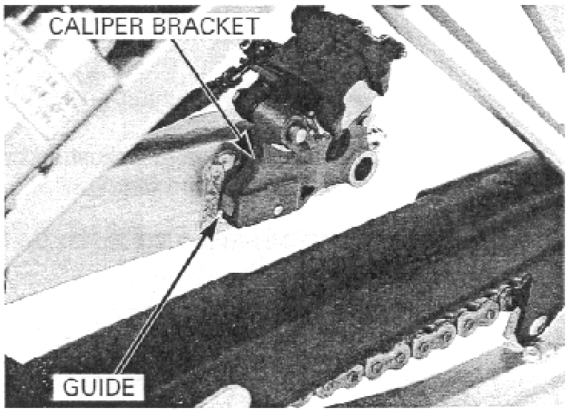


Install the shock link plate-to-swingarm bolt/nut, then tighten the nut to the specified torque.

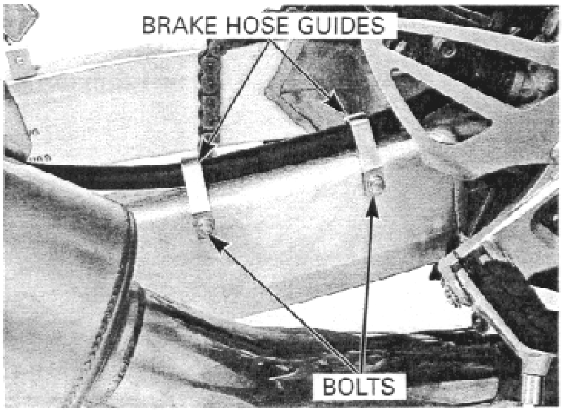
TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)



Route the brake hose properly, then install the rear brake caliper/bracket onto the boss of the swingarm.

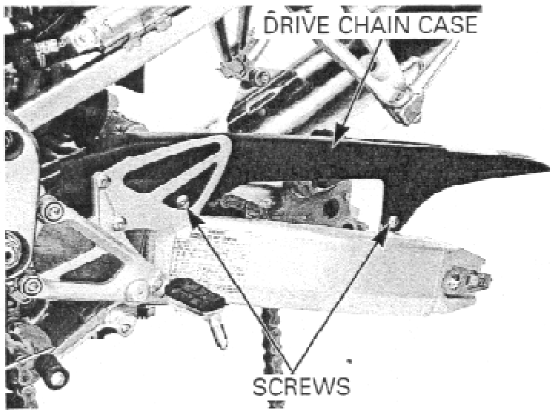


Install the brake hose guide and tighten the bolts.

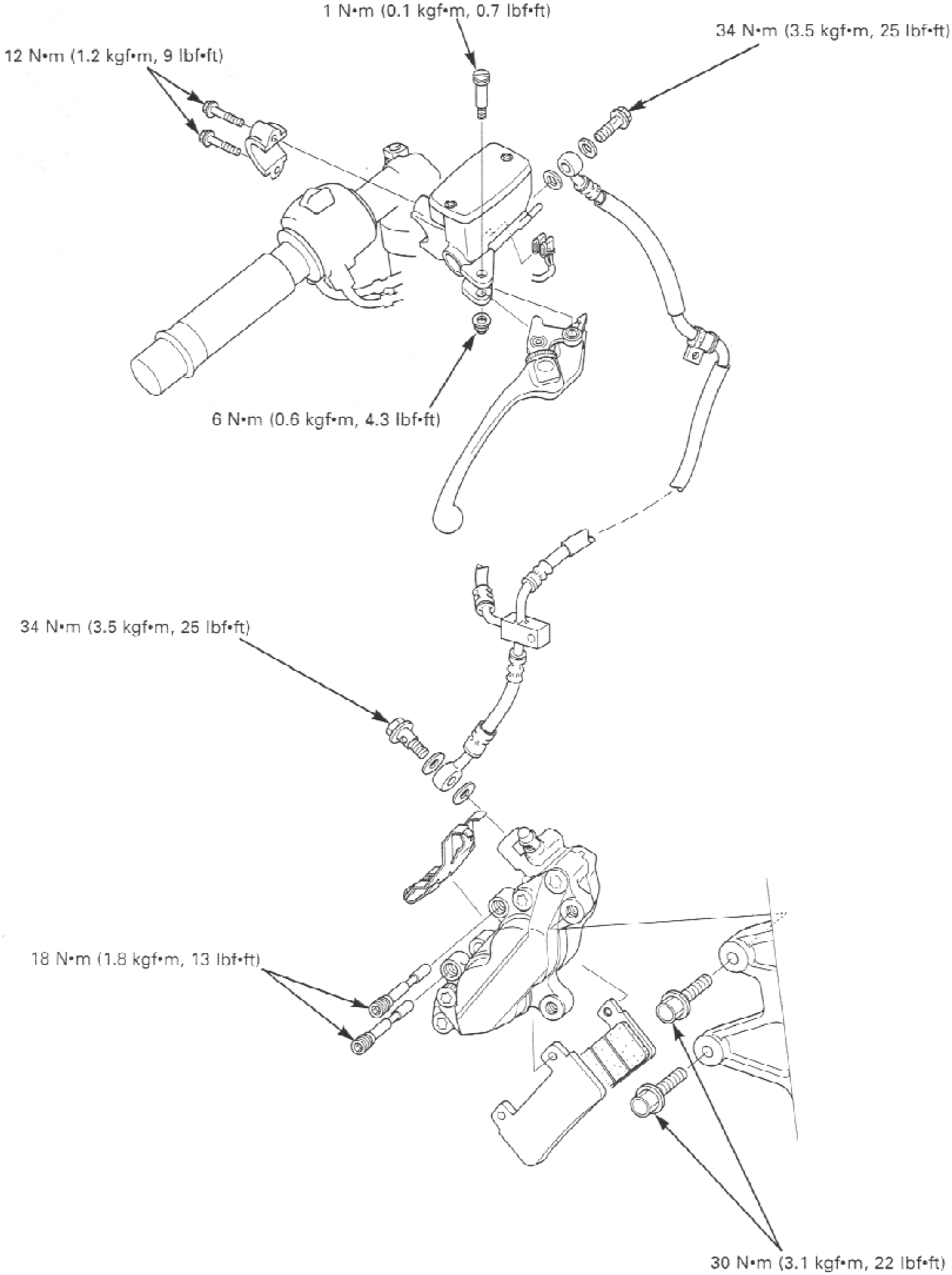


Install the drive chain case aligning the hole with the boss of the swingarm.
Tighten the drive chain case screws securely.

Install the rear wheel (page 14-8).

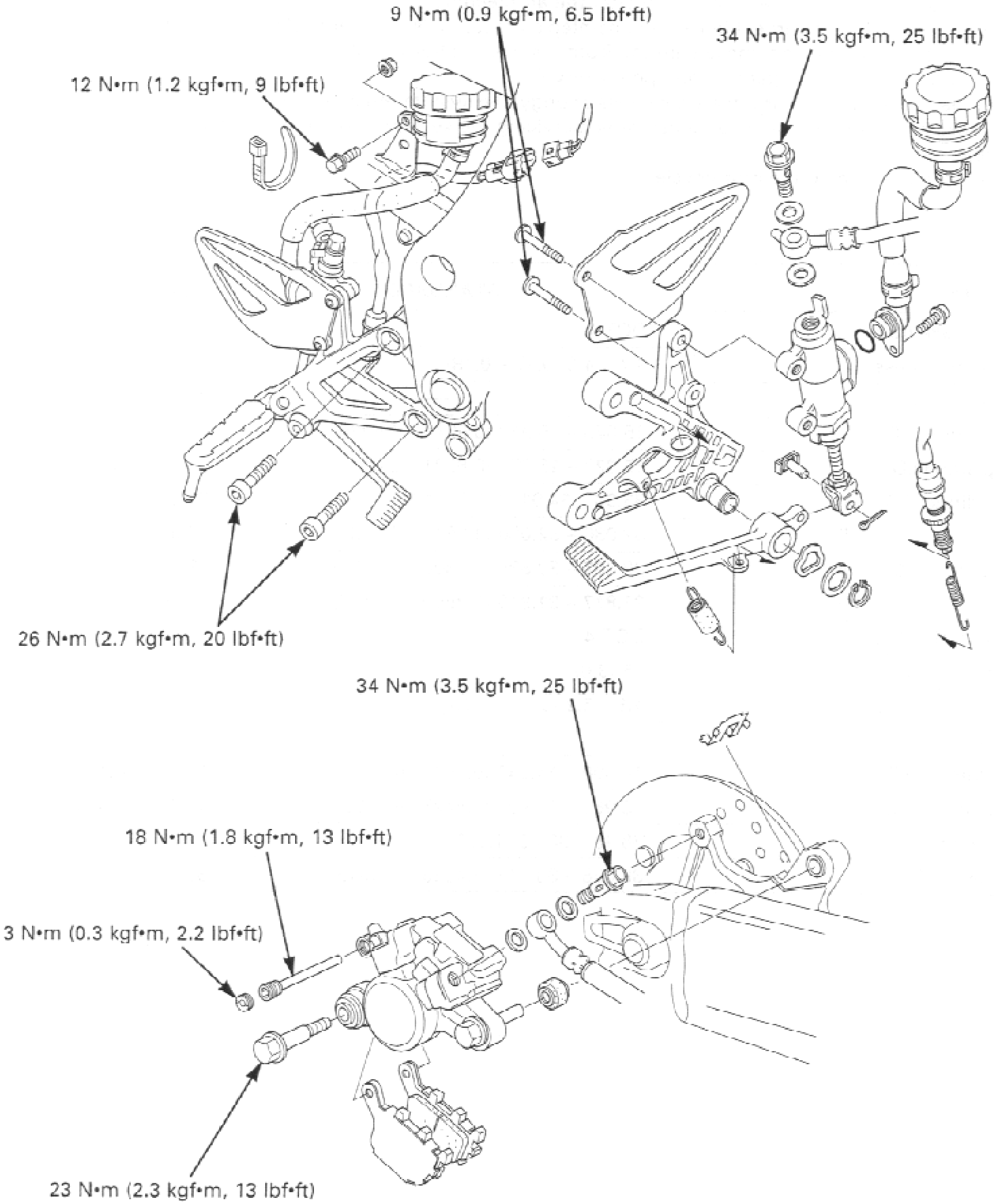


FRONT:



1 N•m (0.1 kgf•m, 0.7 lbf•ft)
34 N•m (3.5 kgf•m, 25 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)
6 N•m (0.6 kgf•m, 4.3 lbf•ft)
34 N•m (3.5 kgf•m, 25 lbf•ft)
18 N•m (1.8 kgf•m, 13 lbf•ft)
30 N•m (3.1 kgf•m, 22 lbf•ft)

REAR:



9 N•m (0.9 kgf•m, 6.5 lbf•ft)
34 N•m (3.5 kgf•m, 25 lbf•ft)
12 N•m (1.2 kgf•m, 9 lbf•ft)
26 N•m (2.7 kgf•m, 20 lbf•ft)
34 N•m (3.5 kgf•m, 25 lbf•ft)
18 N•m (1.8 kgf•m, 13 lbf•ft)
3 N•m (0.3 kgf•m, 2.2 lbf•ft)
23 N•m (2.3 kgf•m, 13 lbf•ft)

SERVICE INFORMATION

GENERAL

⚠ CAUTION

Frequent inhalation of brake pad dust, regardless of material composition could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use and OSHA-approved vacuum cleaner.

- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake digreasing agent.
- Check the brake system by applying the brake lever or pedal after the air bleeding.
- Spilled brake fluid will severely damage instrument lenses and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the front reservoir is horizontal first.
- Never allow contaminates (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid they may not be compatible.
- Always check brake operation before riding the motorcycle.

SPECIFICATIONS

Unit: mm (in)

ITEM			STANDARD	SERVICE LIMIT
Front	Specified brake fluid		DOT 4	—
	Brake disc thickness		4.4 – 4.6 (0.17 – 0.18)	3.5 (0.14)
	Brake disc runout		—	0.20 (0.008)
	Master cylinder I.D.		15.870 – 15.913 (0.6248 – 0.6265)	15.925 (0.6270)
	Master piston O.D.		15.827 – 15.854 (0.6231 – 0.6242)	15.815 (0.6226)
	Caliper cylinder I.D.	A	33.96 – 34.01 (1.337 – 1.339)	34.02 (1.339)
		B	32.030 – 32.080 (1.2610 – 1.2630)	32.09 (1.263)
	Caliper piston O.D.	A	33.802 – 33.835 (1.3308 – 1.3321)	33.794 (1.3305)
		B	31.877 – 31.910 (1.2550 – 1.2563)	31.869 (1.2547)
Rear	Specified brake fluid		DOT 4	—
	Brake pedal height		75 (3.0)	—
	Brake disc thickness		4.8 – 5.2 (0.19 – 0.20)	4.0 (0.16)
	Brake disc runout		—	0.30 (0.012)
	Master cylinder I.D.		14.000 – 14.043 (0.5512 –0.5529)	14.055 (0.5533)
	Master piston O.D.		13.957 – 13.984 (0.5495 –0.5506)	13.945 (0.5490)
	Caliper cylinder I.D.		38.18 – 38.23 (1.053 – 1.505)	38.24 (1.506)
	Caliper piston O.D.		38.098 – 38.148 (1.4999 – 1.5019)	38.09 (1.500)

TORQUE VALUES

Front master cylinder reservoir cap screw	2 N•m (0.2 kgf•m, 1.4 lbf•ft)	
Brake lever pivot bolt	1 N•m (0.1 kgf•m, 0.7 lbf•ft)	
Brake lever pivot nut	6 N•m (0.6 kgf•m, 4.3 lbf•ft)	
Front brake light switch screw	1 N•m (0.1 kgf•m, 0.7 lbf•ft)	
Front master cylinder mounting bolt	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Front brake caliper assembly torx bolt	23 N•m (2.3 kgf•m, 17 lbf•ft)	Apply a locking agent to the threads.
Front brake caliper mounting flange bolt	30 N•m (3.1 kgf•m, 22 lbf•ft)	ALOC bolt.
Rear master cylinder joint nut	18 N•m (1.8 kgf•m, 13 lbf•ft)	
Rear master cylinder mounting bolt	9 N•m (0.9 kgf•m, 6.5 lbf•ft)	
Rear brake reservoir mounting bolt/nut	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Rear brake caliper bracket bolt	23 N•m (2.3 kgf•m, 17 lbf•ft)	
Rear brake caliper pin bolt	27 N•m (2.8 kgf•m, 20 lbf•ft)	Apply a locking agent to the threads.
Pad pin	18 N•m (1.8 kgf•m, 13 lbf•ft)	
Pad pin plug	3 N•m (0.3 kgf•m, 2.2 lbf•ft)	
Brake hose oil bolt	34 N•m (3.5 kgf•m, 25 lbf•ft)	
Brake caliper bleeder valve	6 N•m (0.6 kgf•m, 4.3 lbf•ft)	

TOOL

Snap ring pliers	07914–SA50001

TROUBLESHOOTING

Brake lever/pedal soft or spongy
- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seal
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Rear caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master cylinder piston
- Contaminated master cylinder
- Bent brake lever/pedal

Brake lever/pedal hard
- Clogged/restricted brake system
- Sticking/worn caliper piston
- Rear caliper not sliding properly
- Clogged/restricted fluid passage
- Worn caliper piston seal
- Sticking/worn master cylinder piston
- Bent brake lever/pedal

Brake drags
- Contaminated brake pad/disc
- Misaligned wheel
- Clogged/restricted brake hose joint
- Warped/deformed brake disc
- Rear caliper not sliding properly
- Clogged/restricted brake hydraulic system
- Sticking/worn caliper piston
- Clogged master cylinder port

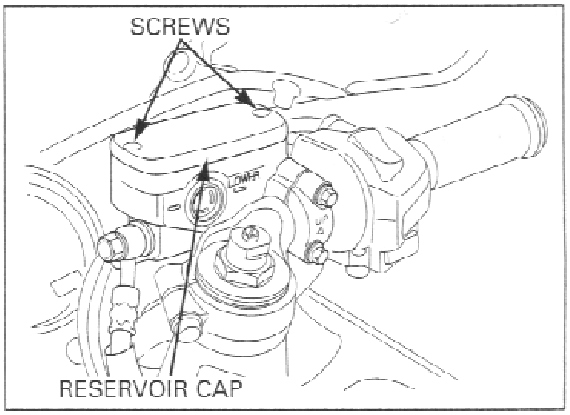
BRAKE FLUID REPLACEMENT/AIR BLEEDING

NOTICE

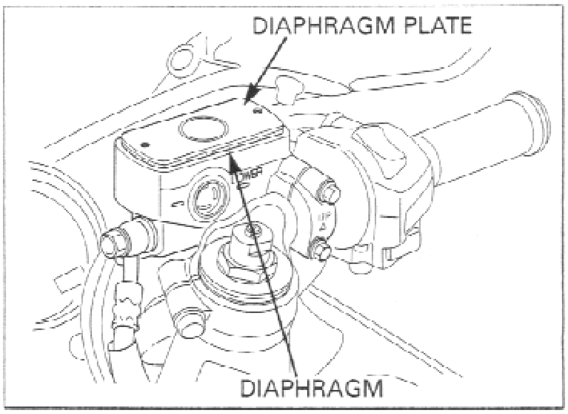
- *Do not allow foreign material to enter the system when filling the reservoir.*
- *Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.*

BRAKE FLUID DRAINING

For the front brake, turn the handlebar until the reservoir is parallel to the ground, before removing the reservoir cap.
Remove the screws and reservoir cap.

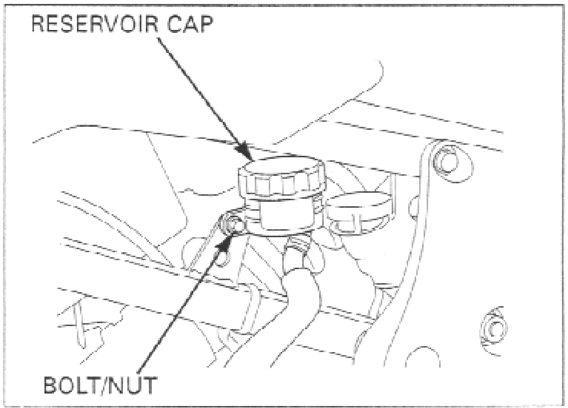


Remove the diaphragm plate and diaphragm.

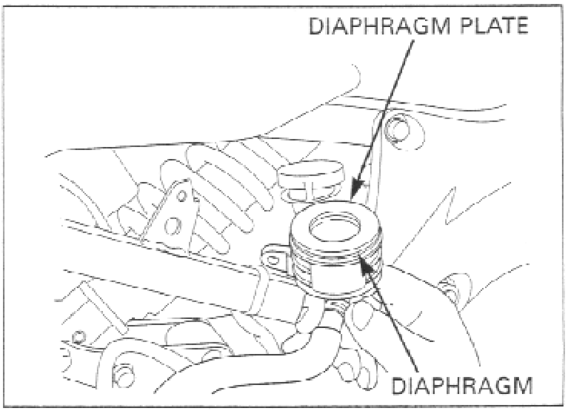


For the rear brake, remove the rear brake reservoir mounting bolt/nut.

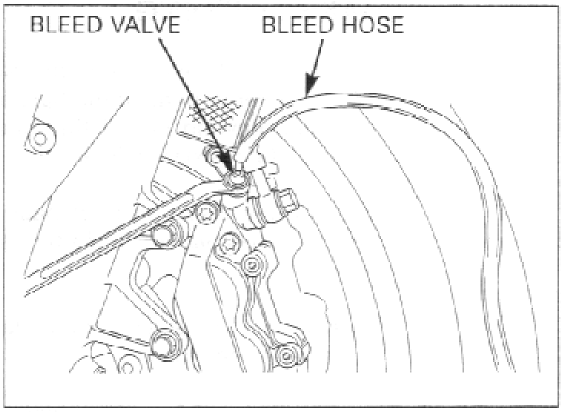
Remove the reservoir cap.



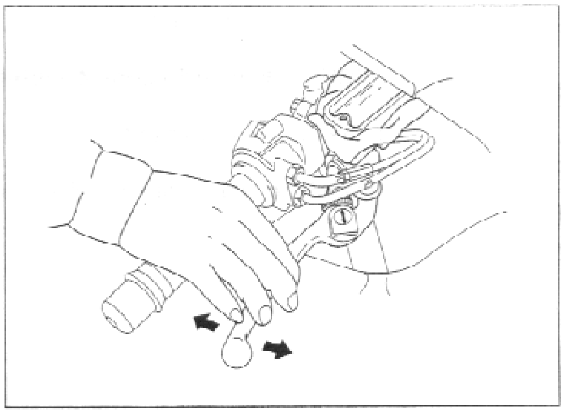
Remove the diaphragm plate and diaphragm.



Connect a bleed hose to the caliper bleed valve.

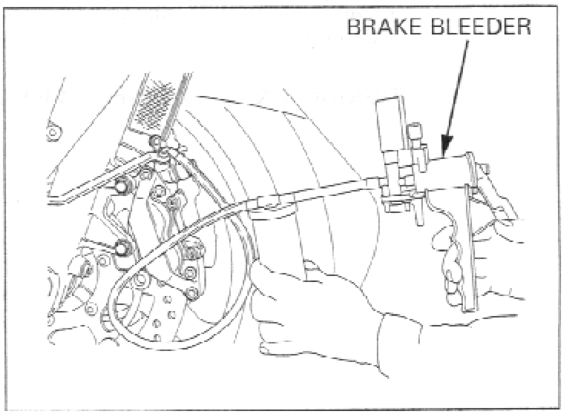


Loosen the bleed valve and pump the brake lever or pedal.
Stop pumping the lever or pedal when fluid stop flowing out of the bleed valve.



BRAKE FLUID FILLING

Fill the reservoir with DOT 4 brake fluid from a sealed container.



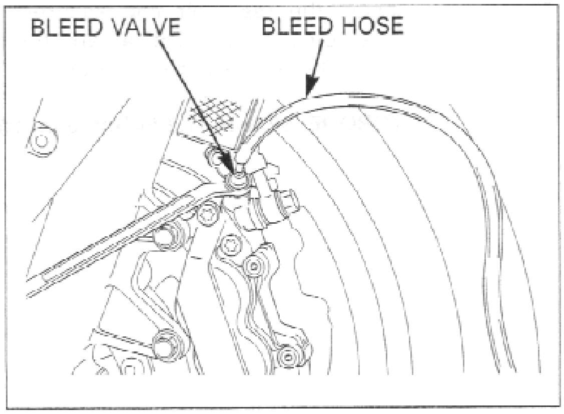
NOTICE

- *Use only DOT 4 brake fluid from a sealed container.*
- *Do not mix different types of fluid, they are not compatible.*

Connect a commercially available brake bleeder to the bleed valve.
Pump the brake bleeder and loosen the bleed valve, adding fluid when the fluid level in the master cylinder reservoir is low.

- Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instructions.

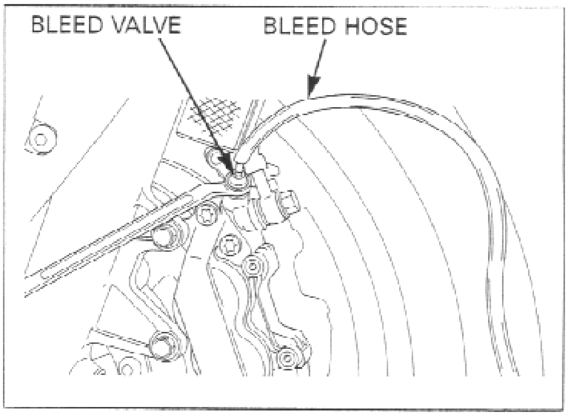
Repeat the previous step procedures until air bubbles do not appear in the plastic hose.



- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.
- If a brake bleeder is not available, fill the master cylinder and operate the brake lever or pedal to fill the system.

Close the bleed valve.
Next, perform the brake bleeding procedure.

BRAKE BLEEDING



Connect a clear bleed hose to the bleed valve.
Pump the lever or pedal until there are no air bubbles in the fluid flowing out of the master cylinder, and lever or pedal resistance is felt.

Do not release the brake lever or pedal until the bleed valve has been closed.

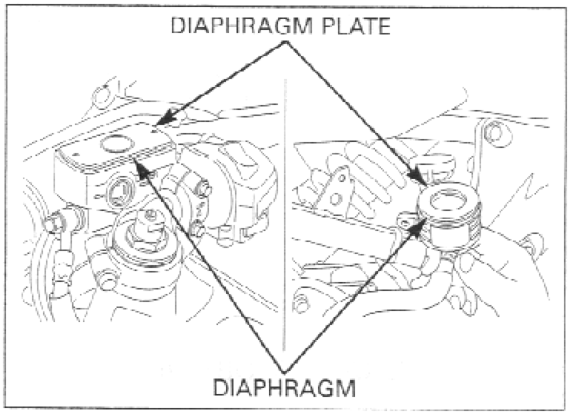
1. Squeeze the brake lever or push the brake pedal, open the bleed valve 1/2 of a turn and then close the valve.
2. Release the brake lever or pedal until the bleed valve has been closed.

Repeat steps 1 and 2 until bubbles cease to appear in the fluid coming out of the bleed valve.
Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)

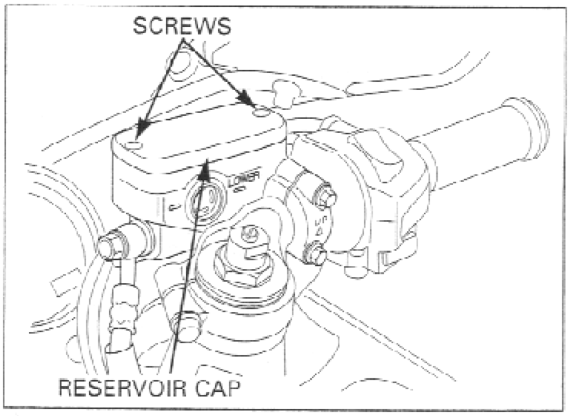
Fill the fluid reservoir to the upper level.

Reinstall the diaphragm and diaphragm plate.



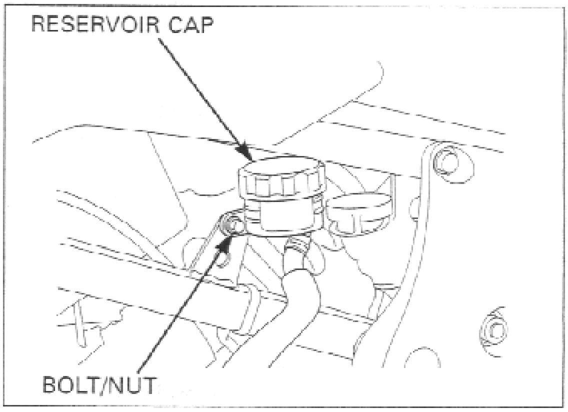
Install the reservoir cap, and tighten the screws to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)



Install the reservoir cap securely, then install the reservoir onto the seat rail and tighten the mounting bolt/nut to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

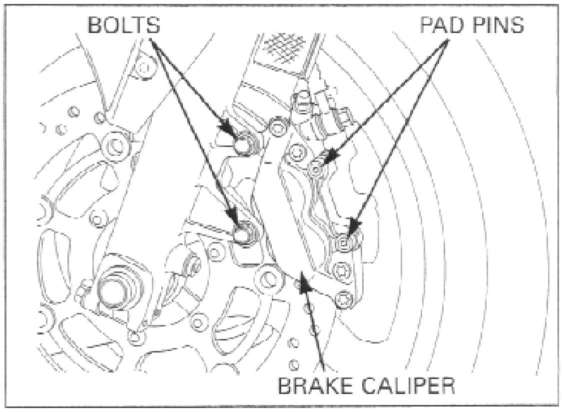


BRAKE PAD/DISC

Always replace the brake pads in pairs to assure even disc pressure.

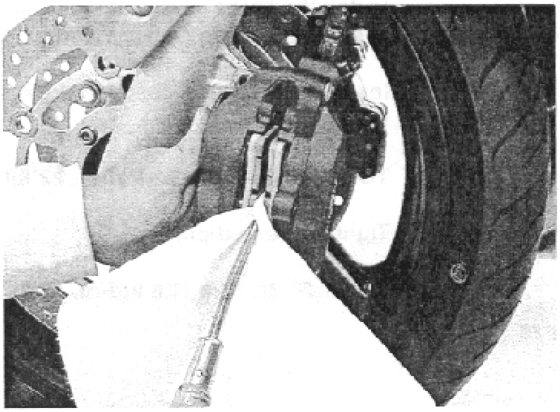
FRONT BRAKE PAD REPLACEMENT

Loosen the pad pins.
Remove the bolts and brake caliper.

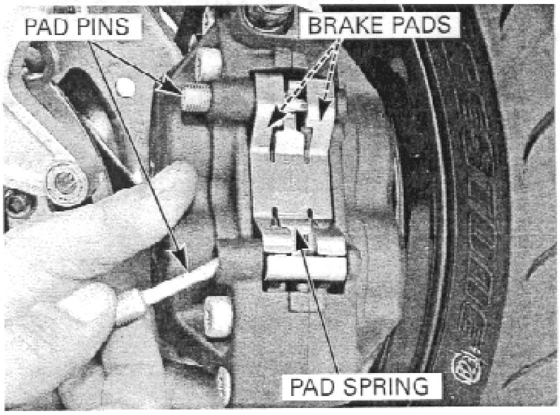


Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.

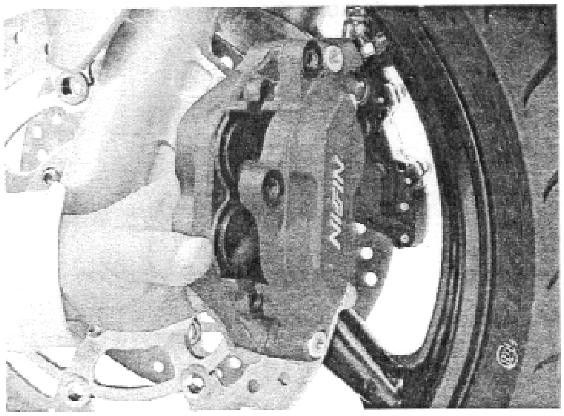
Push the caliper pistons all the way in to allow installation of new brake pads.



Remove the pad pins, pad spring and brake pads.

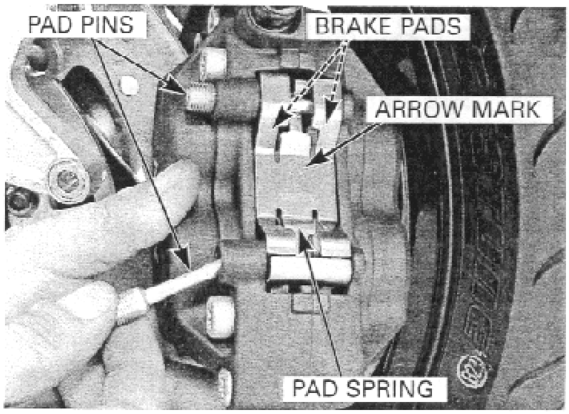


Clean the inside of the caliper especially around the caliper pistons.



Install the new brake pads.
Install the pad spring with its arrow mark facing up as shown.

Push the pad spring, then install the pad pin.



Be careful not to damage the pads.

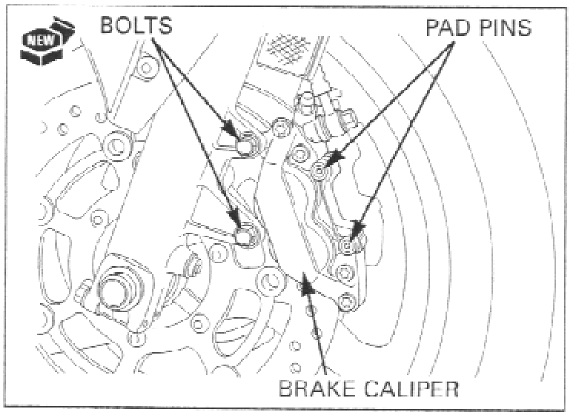
Install the brake caliper to the fork leg so that the disc is positioned between the pads.

Install and tighten the new brake caliper mounting bolts.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

Tighten the pad pins.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

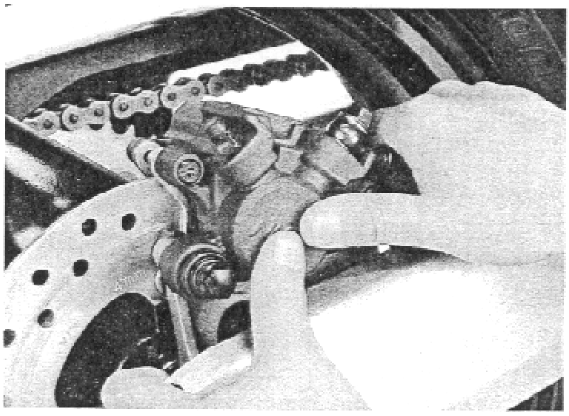


Always replace the brake pads in pairs to assure even disc pressure.

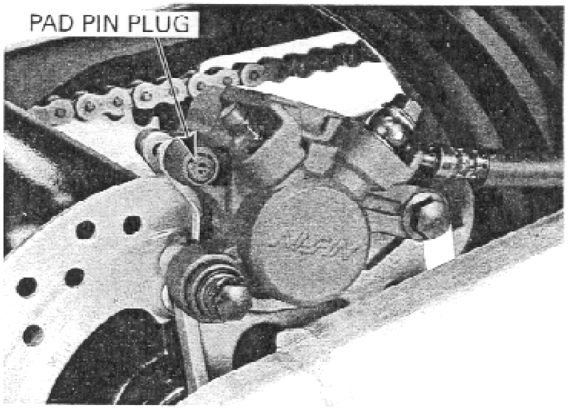
REAR BRAKE PAD REPLACEMENT

Check the brake fluid level in the brake master cylinder reservoir as this operation causes the level to rise.

Push the caliper pistons all the way in by pushing the caliper body inward to allow installation of new brake pads.

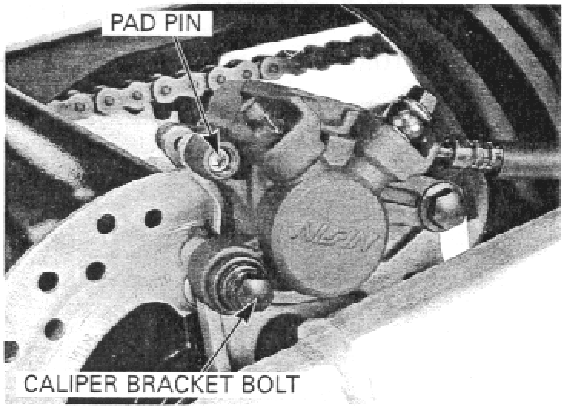


Remove the pad pin plug.

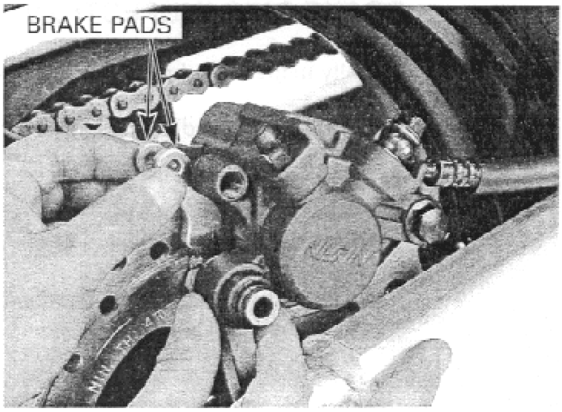


Loosen the pad pin.

Remove the caliper bracket bolt.



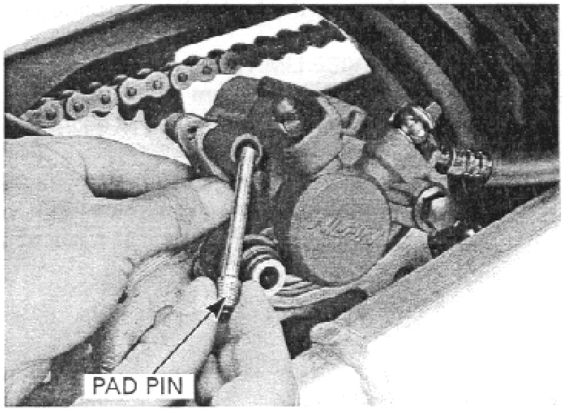
Pivot the caliper up.
Remove the pad pin and brake pads.



Make sure the brake pad spring is in place.
Install the new brake pads.

Lower the caliper while pushing the pads against the pad spring so the pad ends are positioned onto the retainer on the caliper bracket.

Install the pad pin.

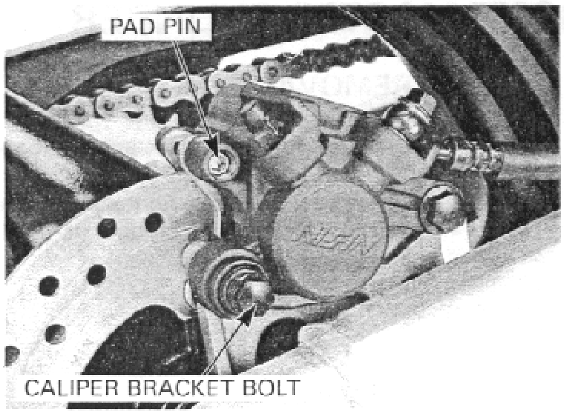


Install and tighten the caliper bracket bolt.

TORQUE: 23 N•m (2.3 kgf•m, 17 lbf•ft)

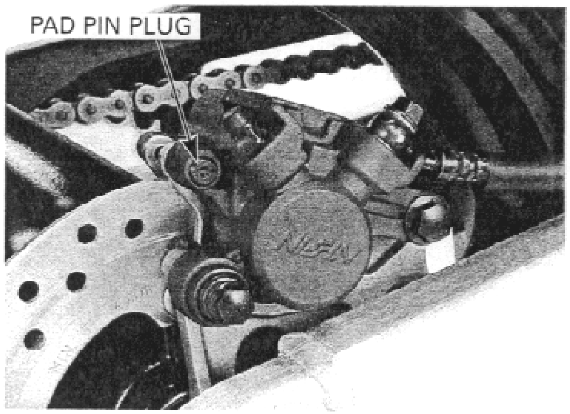
Tighten the pad pin.

TORQUE: 18 N•m (1.8 kgf•m, 13 lbf•ft)



Install and tighten the pad pin plug.

TORQUE: 3 N•m (0.3 kgf•m, 2.2 lbf•ft)



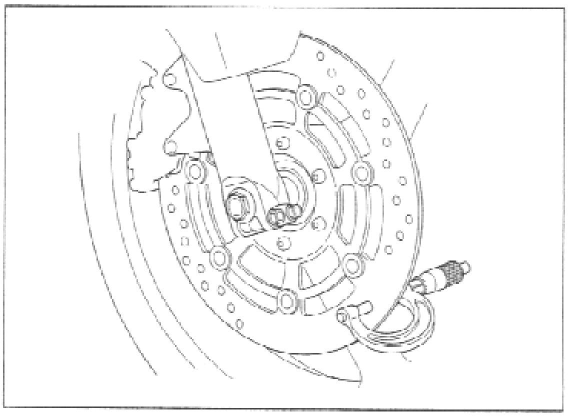
BRAKE DISC INSPECTION

Visually inspect the brake disc for damage or cracks.

Measure the brake disc thickness with a micrometer.

SERVICE LIMITS:
FRONT: 3.5 mm (0.14 in)
REAR: 4.0 mm (0.16 in)

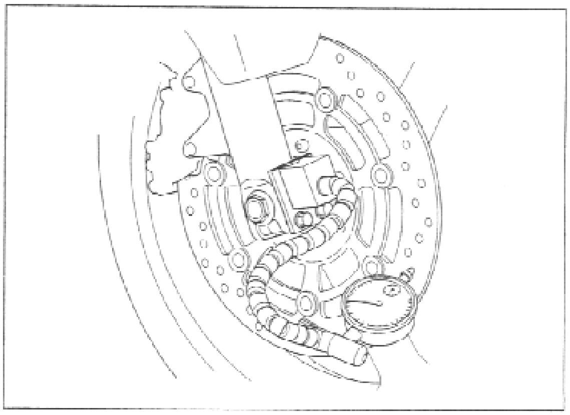
Replace the brake disc if the smallest measurement is less than the service limit.



Measure the brake disc warpage with a dial indicator.

SERVICE LIMITS:
FRONT: 0.20 mm (0.008 in)
REAR: 0.30 mm (0.012 in)

Check the wheel bearings for excessive play, if the warpage exceeds the service limit.
Replace the brake disc if the wheel bearings are normal.



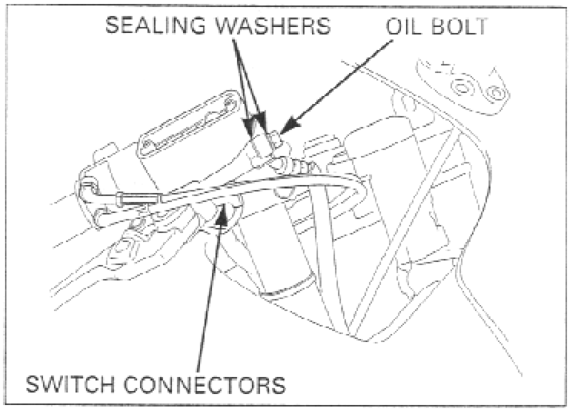
FRONT MASTER CYLINDER

REMOVAL

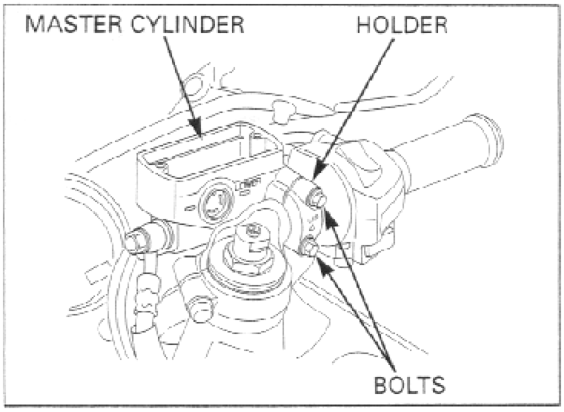
Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

Drain the front hydraulic system (page 15-4).

Disconnect the brake light switch wire connectors.
Remove the brake hose oil bolt, sealing washers and brake hose eyelet.

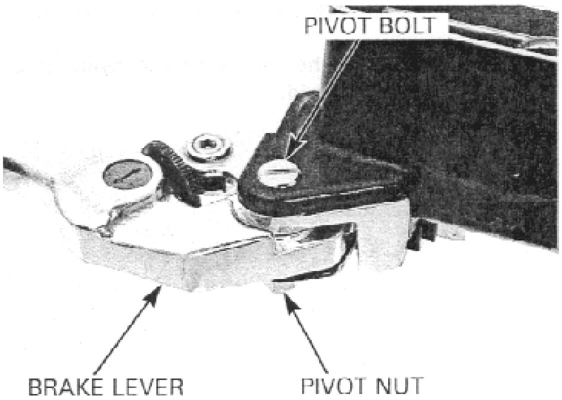


Remove the bolts from the master cylinder holder and remove the master cylinder assembly.

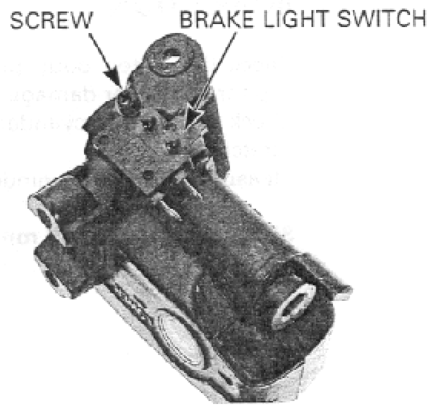


DISASSEMBLY

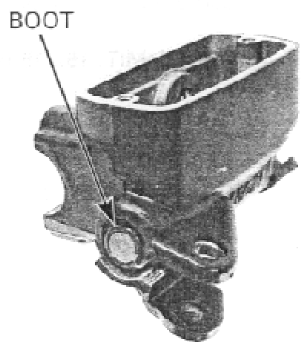
Remove the pivot bolt/nut and brake lever assembly.



Remove the screw and brake light switch.

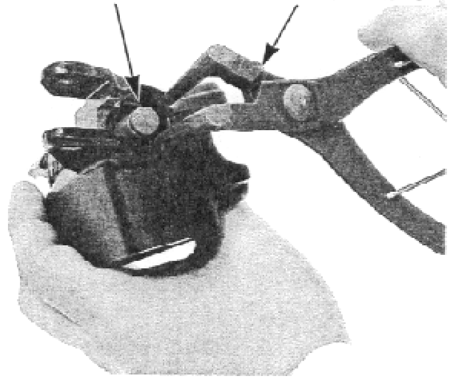


Remove the boot.



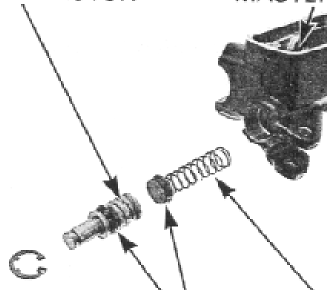
Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:
Snap ring pliers **07914–SA50000**



Remove the master piston and spring.

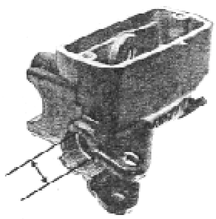
Clean the inside of the cylinder and reservoir with brake fluid.



INSPECTION

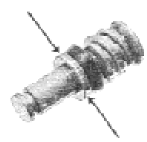
Check the piston boot, primary cup and secondary cup for fatigue or damage.
Check the master cylinder and piston for abnormal scratches.
Measure the master cylinder I.D.

SERVICE LIMIT: 15.925 mm (0.6270 in)

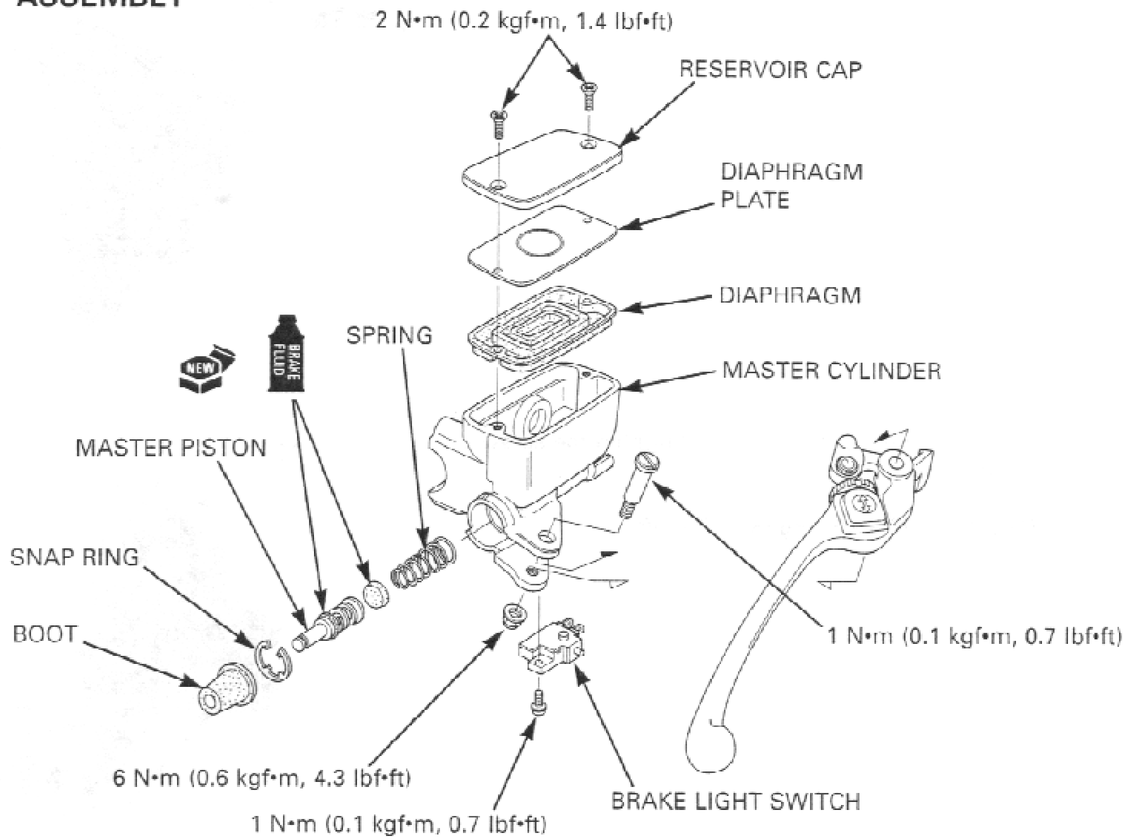


Measure the master cylinder piston O.D.

SERVICE LIMIT: 15.815 mm (0.6226 in)



ASSEMBLY

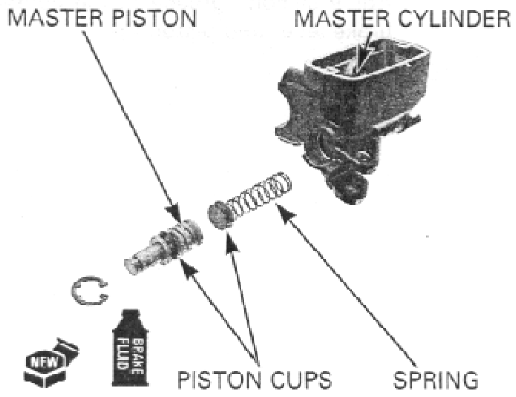


Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Coat all parts with clean brake fluid before assembly.

When installing the cups, do not allow the lips to turn inside out.

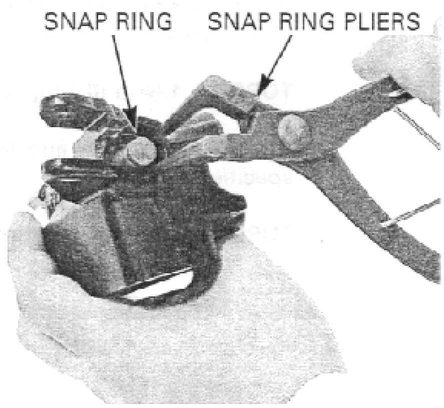
Dip the piston in brake fluid.
Install the spring into the piston.
Install the piston assembly into the master cylinder.



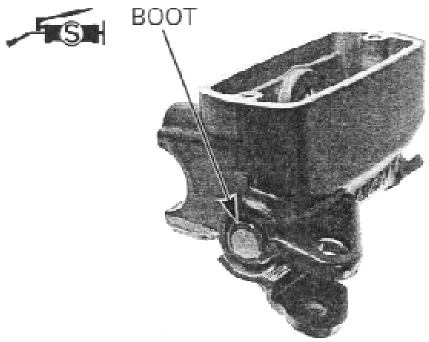
Be certain the snap ring is firmly seated in the groove.

Install the snap ring.

TOOL:
Snap ring pliers **07914–SA50000**

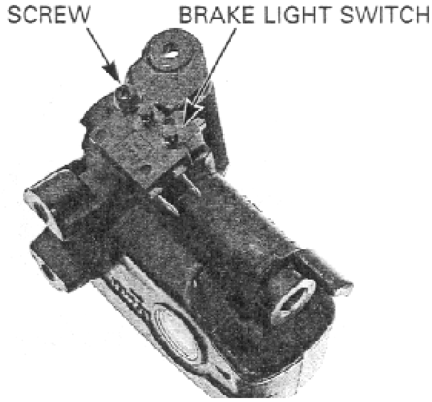


Install the boot.

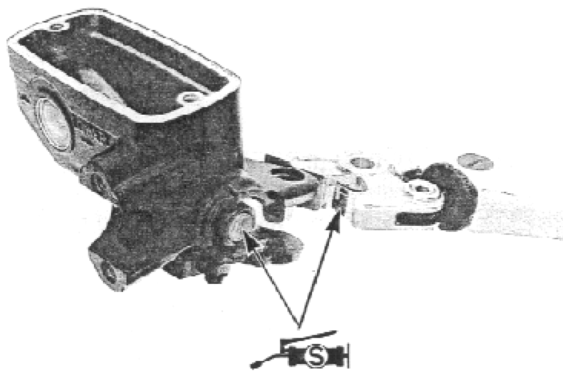


Install the brake light switch and tighten the screw to the specified torque.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)



Apply silicone grease to the contact surfaces of the brake lever and piston tip.

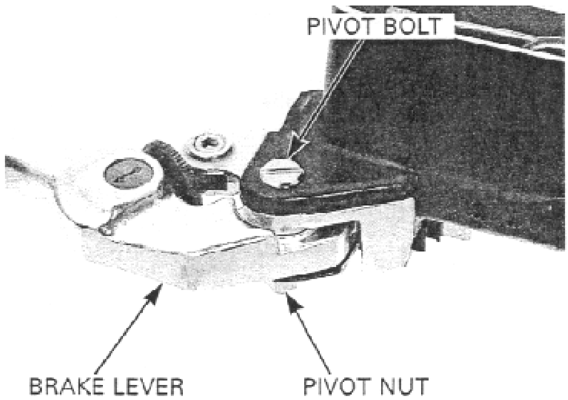


Install the brake lever assembly, tighten the pivot bolt to the specified torque.

TORQUE: 1 N·m (0.1 kgf·m, 0.7 lbf·ft)

Hold the pivot bolt and tighten the pivot nut to the specified torque.

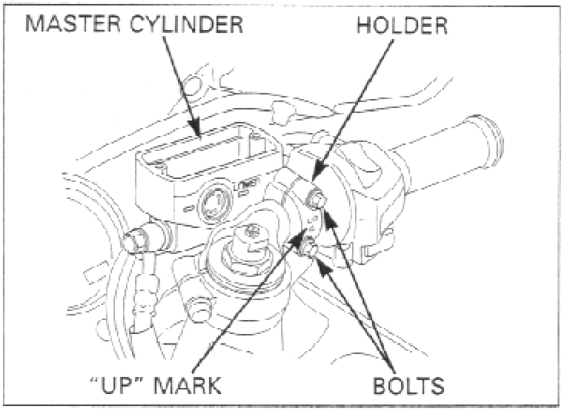
TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)



Place the master cylinder assembly on the handlebar. Align the end of the master cylinder with the punch mark on the handlebar.

Install the master cylinder holder with the "UP" mark facing up.
Tighten the upper bolt first, then the lower bolt to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

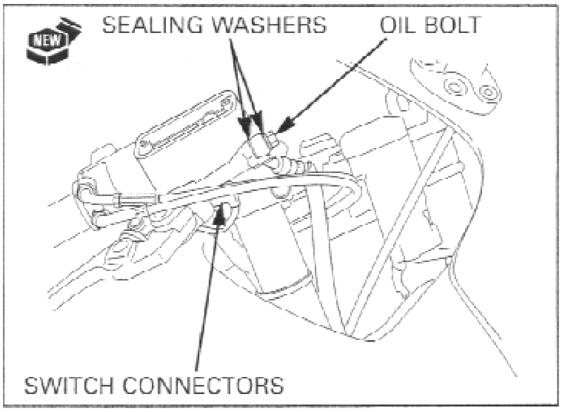


Install the brake hose eyelet with the oil bolt and new sealing washers.
Push the eyelet joint against the stopper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Connect the brake light switch wire connectors.

Fill the reservoir to the upper level and bleed the brake system (page 15-4).

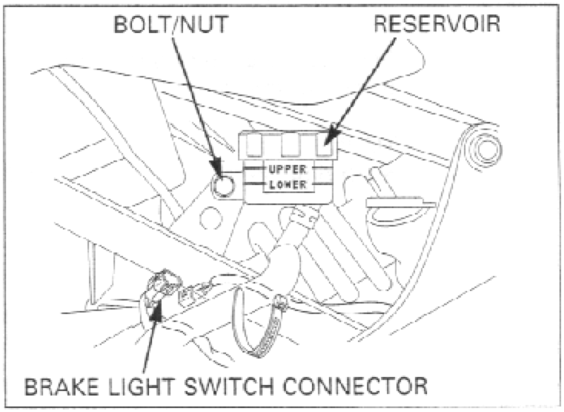


REAR MASTER CYLINDER

REMOVAL

Drain the rear hydraulic system (page 15-4).

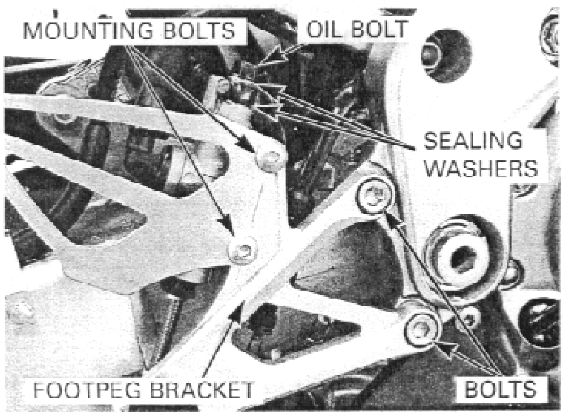
Remove the brake light switch wire clamp.
Disconnect the brake light switch 2P (Black) connector.
Remove the rear master cylinder reservoir mounting bolt/nut.



Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

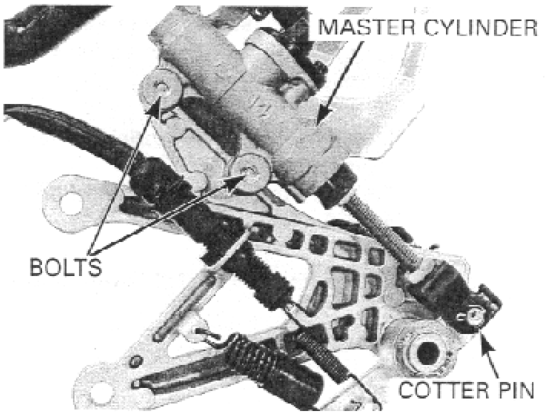
Remove the brake hose oil bolt, sealing washers and brake hose.

Loosen the rear master cylinder mounting bolts.
Remove the rider footpeg bracket socket bolts and driver footpeg bracket assembly.



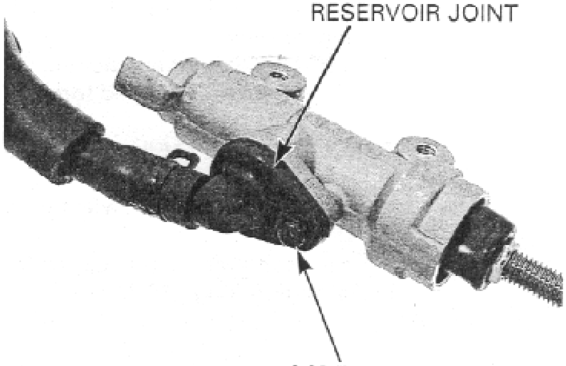
Remove and discard the brake pedal joint cotter pin.
Remove the joint pin.

Remove the master cylinder mounting bolts, step guard and master cylinder.



DISASSEMBLY

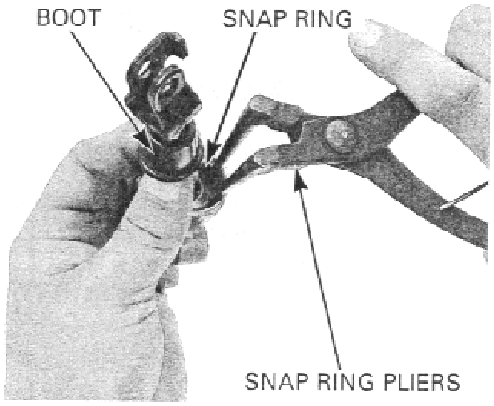
Remove the screw and reservoir hose joint from the master cylinder.



Remove the boot.

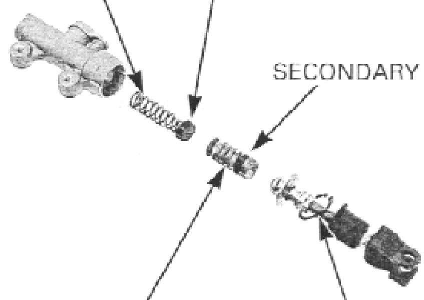
Remove the snap ring from the master cylinder body using the special tool as shown.

TOOL:
Snap ring pliers **07914-SA50000**



Remove the push rod, master piston, primary cup and spring.

Clean the inside of the cylinder with brake fluid.



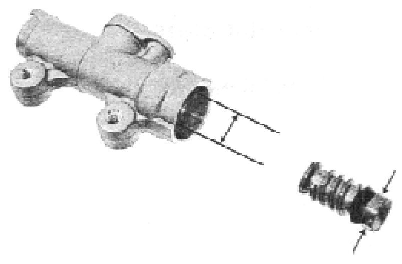
INSPECTION

Check the piston boot, primary cup and secondary cup for fatigue or damage.
Check the master cylinder and piston for abnormal scratches.
Measure the master cylinder I.D.

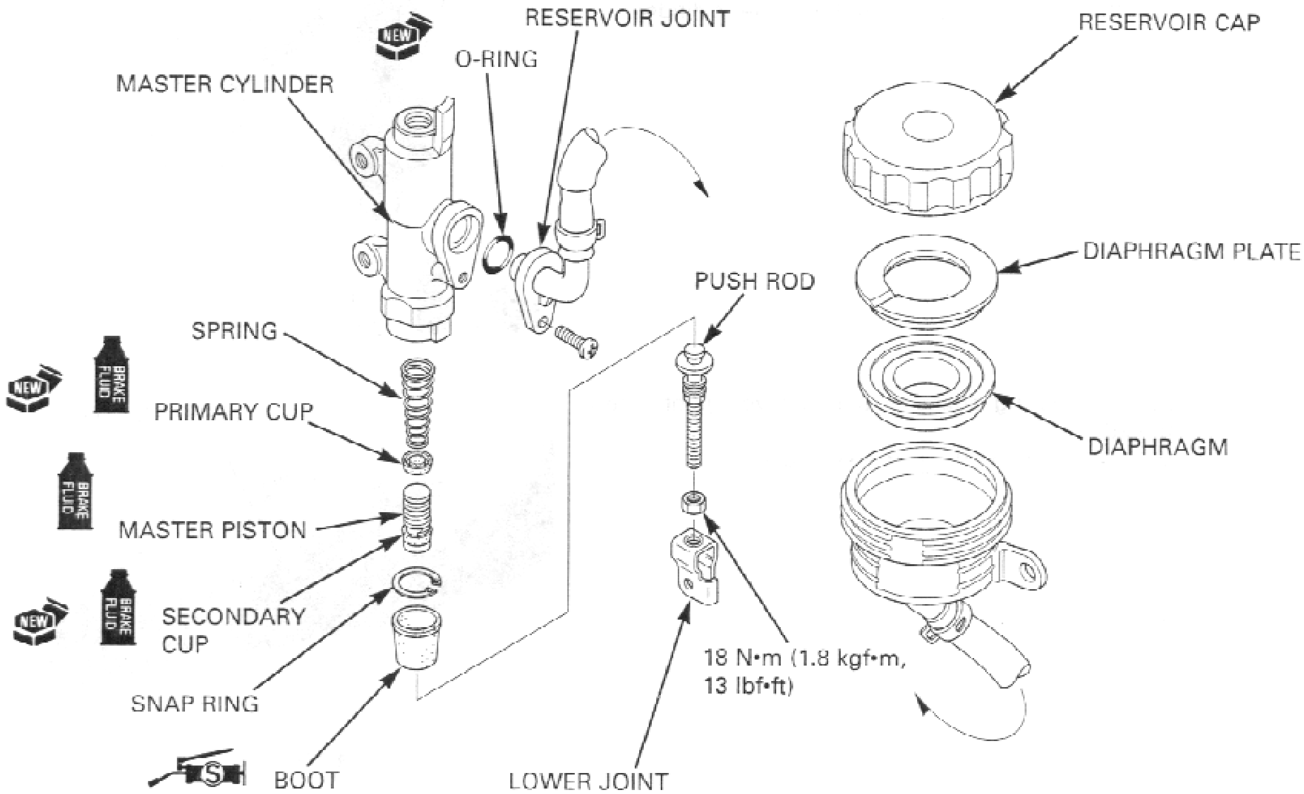
SERVICE LIMIT: 14.055 mm (0.5533 in)

Measure the master cylinder piston O.D.

SERVICE LIMIT: 13.945 mm (0.5490 in)



ASSEMBLY

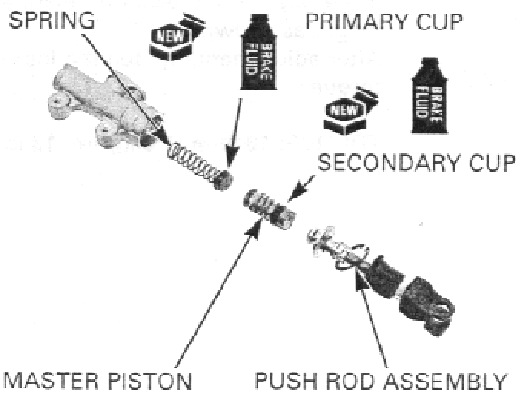


Keep the piston, cups, spring, snap ring and boot as a set; do not substitute individual parts.

Coat all parts with clean brake fluid before assembly.

When installing the cups, do not allow the lips to turn inside out.

Dip the piston in brake fluid.
Install the spring onto the primary cup.
Install the spring/primary cup and master piston assembly.
Apply silicone grease to the piston contact area of the push rod.

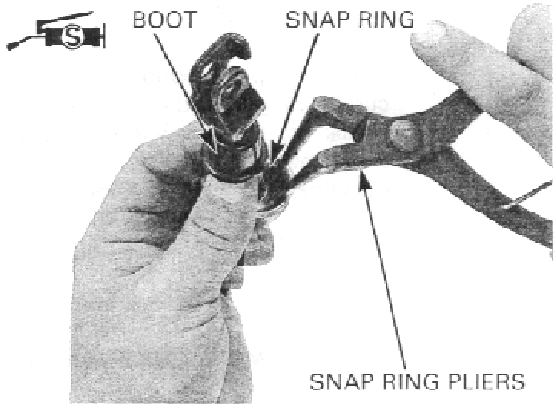


Be certain the snap ring is firmly seated in the groove.

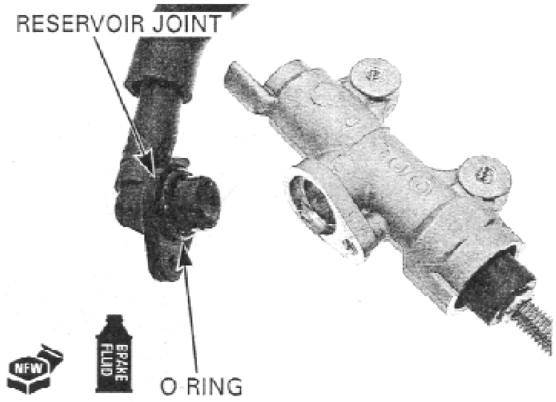
Install the push rod into the master cylinder.
Install the snap ring.

TOOL:
Snap ring pliers **07914–SA50000**

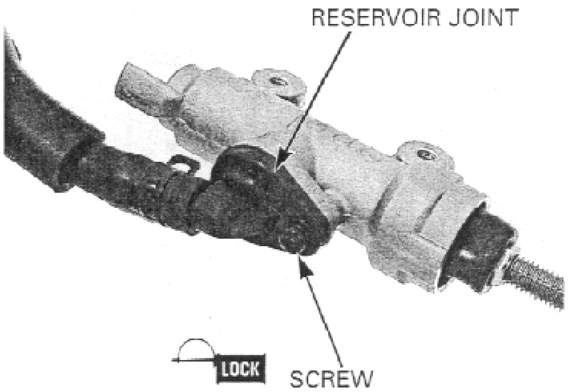
Install the boot.



Apply brake fluid to a new O-ring and install it onto the reservoir joint.
Install the reservoir joint into the master cylinder.

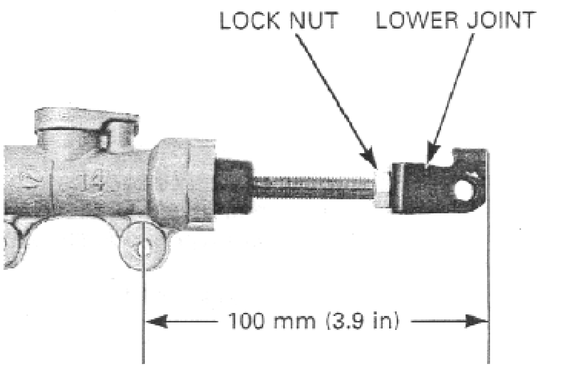


Apply a locking agent to the reservoir joint screw threads.
Install and tighten the screw securely.

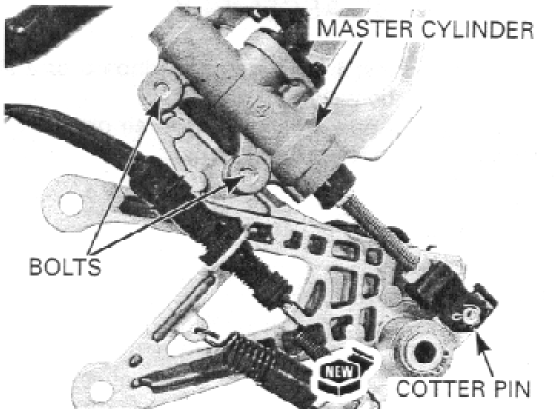


If the push rod is disassembled, adjust the push rod length as shown.
After adjustment, tighten the lock nut to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

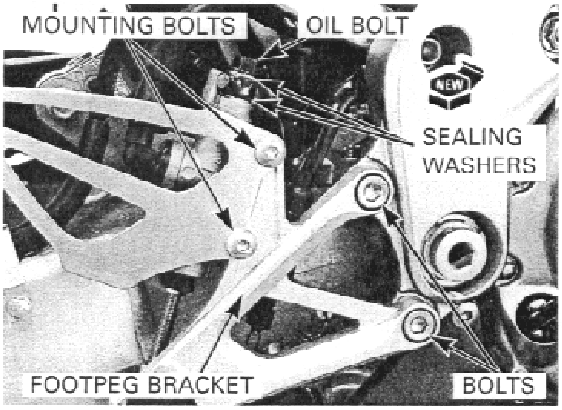


INSTALLATION



Place the master cylinder onto the main footpeg bracket, install the step guard and master cylinder mounting bolts.

Connect the brake pedal to the push rod lower joint. Install the joint pin and secure it with a new cotter pin.



Install the rider footpeg bracket onto the frame, tighten the socket bolts to the specified torque.

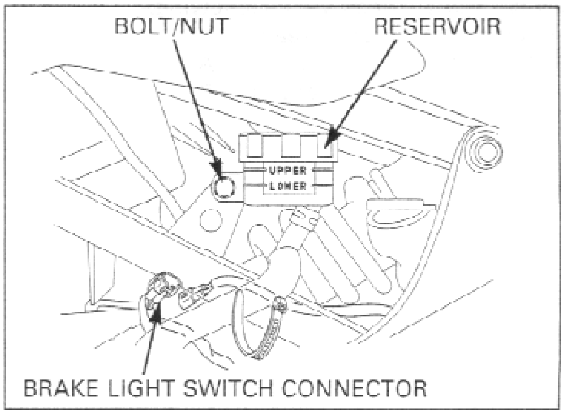
TORQUE: 26 N•m (2.7 kgf•m, 20 lbf•ft)

Tighten the master cylinder mounting bolts to the specified torque.

TORQUE: 9 N•m (0.9 kgf•m, 6.5 lbf•ft)

Install the brake hose with the oil bolt and new sealing washers.
Push the eyelet joint against the stopper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N•m (3.5 kgf•m, 25 lbf•ft)



Install and tighten the brake reservoir mounting bolt/nut to the specified torque.

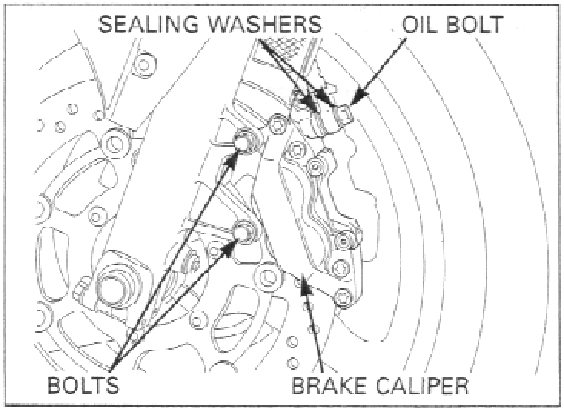
TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Connect the brake light switch 2P (Black) connector.
Secure the brake light switch wire with a wire clamp.

Fill the reservoir to the upper level and bleed the brake system (page 15-4).

FRONT BRAKE CALIPER

REMOVAL



Drain the front brake hydraulic system (page 15-4).

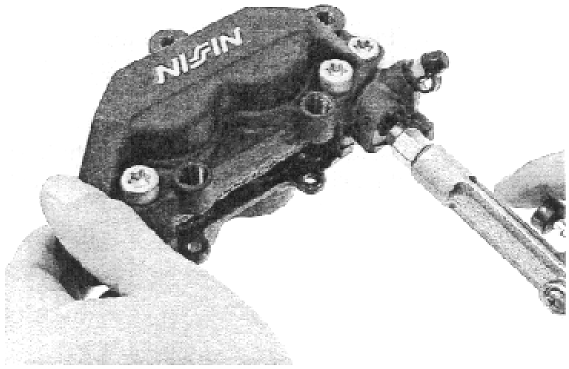
Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

Remove the oil bolt, sealing washers and brake hose eyelet joint.
Remove the caliper mounting bolts, caliper and the brake pads (page 15-6).

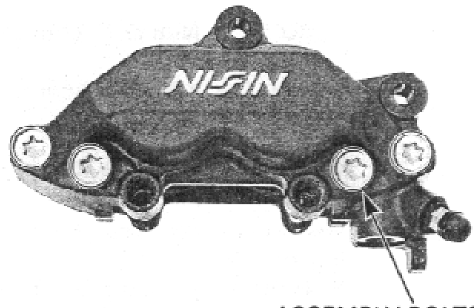
DISASSEMBLY

Do not use high pressure air or bring the nozzle too close to the inlet.

Install corrugated cardboard or a sheet of soft wood between the pistons.
Apply small squirts of air pressure to the fluid inlet to remove the pistons.

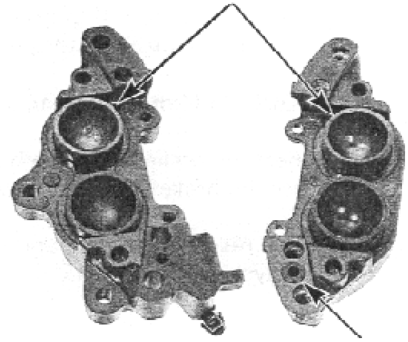


Remove the four caliper assembly bolts and separate the caliper halves.



Mark the pistons to ensure correct reassembly.

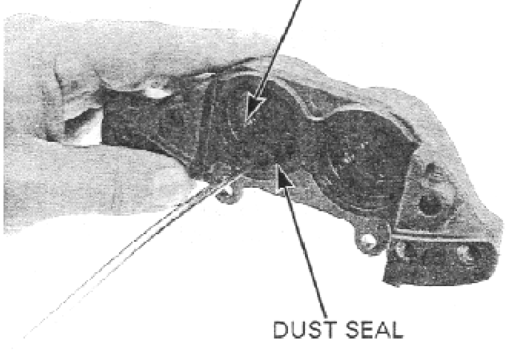
Remove the following:
- Joint seals
- Caliper piston A
- Caliper piston B



Be careful not to damage the piston sliding surface.

Push the dust seals and piston seals in and lift them out.

Clean the seal grooves with clean brake fluid.

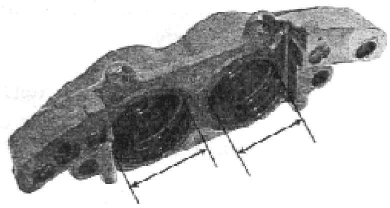


INSPECTION

Check the caliper cylinder for scoring or other damage.

Measure the caliper cylinder I.D.

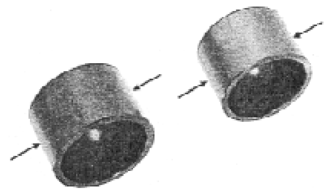
SERVICE LIMITS:
A: 34.02 mm (1.339 in)
B: 32.09 mm (1.263 in)



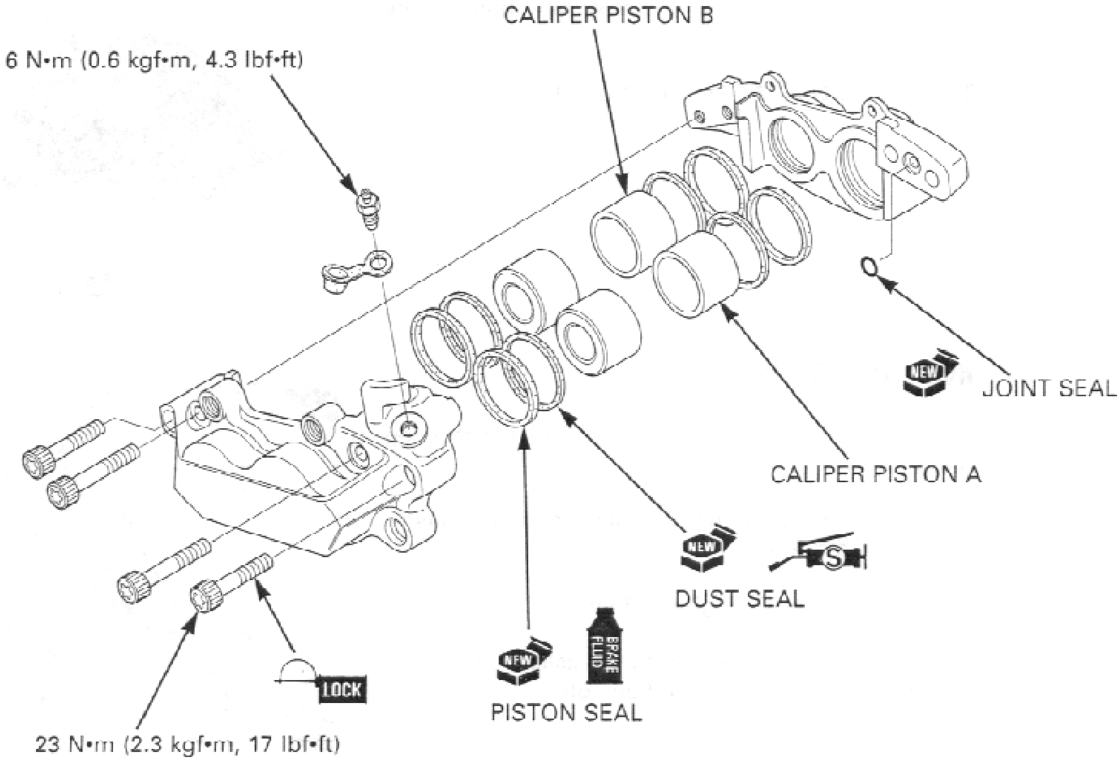
Check the caliper pistons for scratches, scoring or other damage.

Measure the caliper piston O.D.

SERVICE LIMITS:
A: 33.794 mm (1.3305 in)
B: 31.869 mm (1.2547 in)



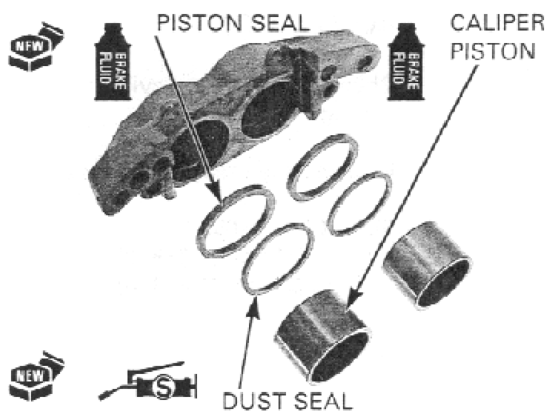
ASSEMBLY



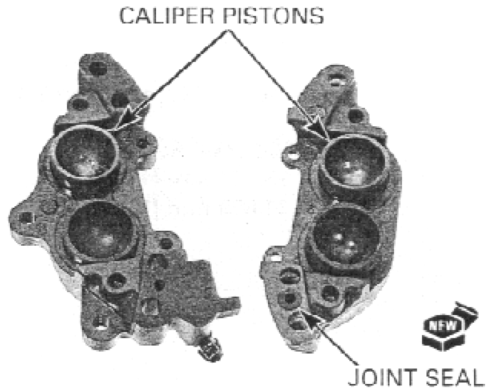
Coat the new piston seals with clean brake fluid.
Coat the new dust seals with silicone grease.

Install the piston and dust seals into the grooves in the caliper body.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinder with their open ends toward the pad.

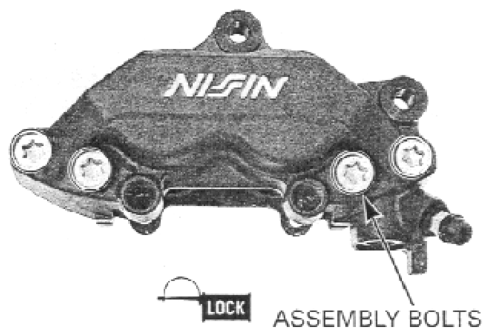


Install the new joint seal into the fluid passage on caliper.



Assemble the caliper halves.
Apply a locking agent to the caliper assembly bolt threads.
Install and tighten the caliper assembly bolts to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)



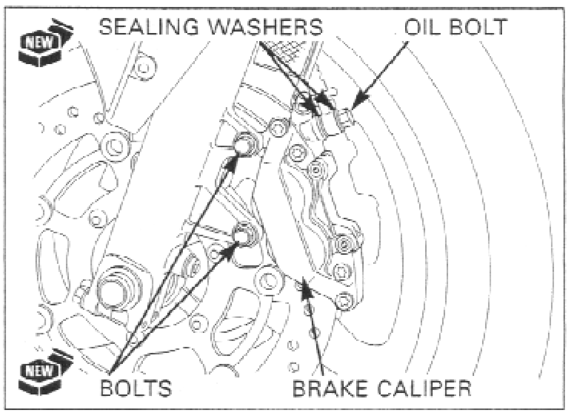
INSTALLATION

Install the brake pads and caliper onto the fork leg (page 15-6).

Install and tighten the new caliper mounting bolts to the specified torque.

TORQUE: 30 N·m (3.1 kgf·m, 22 lbf·ft)

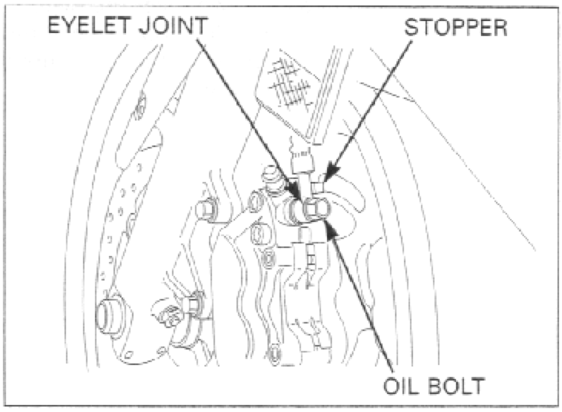
Install the brake hose eyelet to the caliper body with two new sealing washers and oil bolt.



Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N·m (3.5 kgf·m, 25 lbf·ft)

Fill and bleed the front brake hydraulic system (page 15-4).



REAR BRAKE CALIPER

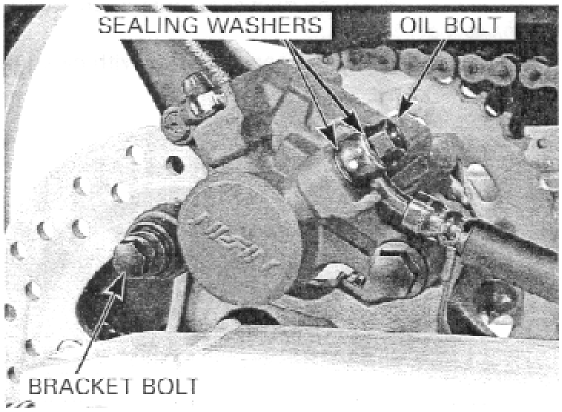
REMOVAL

Drain the rear brake hydraulic system (page 15-5).

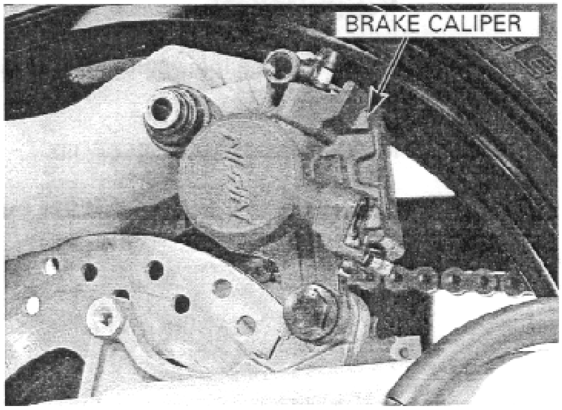
Avoid spilling fluid on painted, plastic, or rubber parts. Place a rag over these parts whenever the system is serviced.

Remove the oil bolt, sealing washers and brake hose eyelet joint.

Remove the caliper bracket bolt and the brake pads (page 15-8).

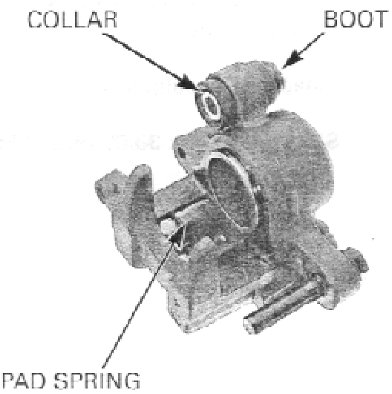


Pivot the caliper up and remove it.



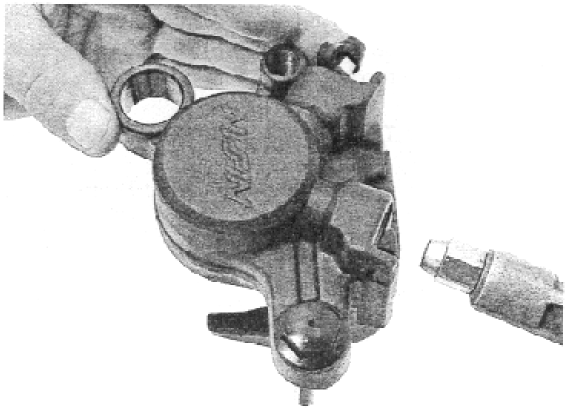
DISASSEMBLY

Remove the pad spring, collar and boot from the caliper body.



Do not use high pressure air or bring the nozzle too close to the inlet.

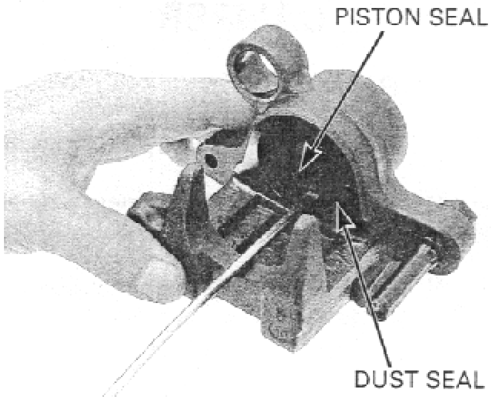
Place a shop towel over the piston.
Position the caliper body with the piston down and apply small squirts of air pressure to the fluid inlet to remove the piston.



Be careful not to damage the piston sliding surface.

Push the dust seal and piston seal in and lift them out.

Clean the seal grooves with clean brake fluid.

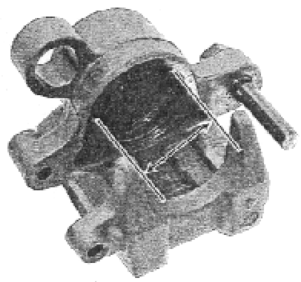


INSPECTION

Check the caliper cylinder for scoring or other damage.

Measure the caliper cylinder I.D.

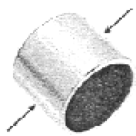
SERVICE LIMIT: 38.24 mm (1.506 in)



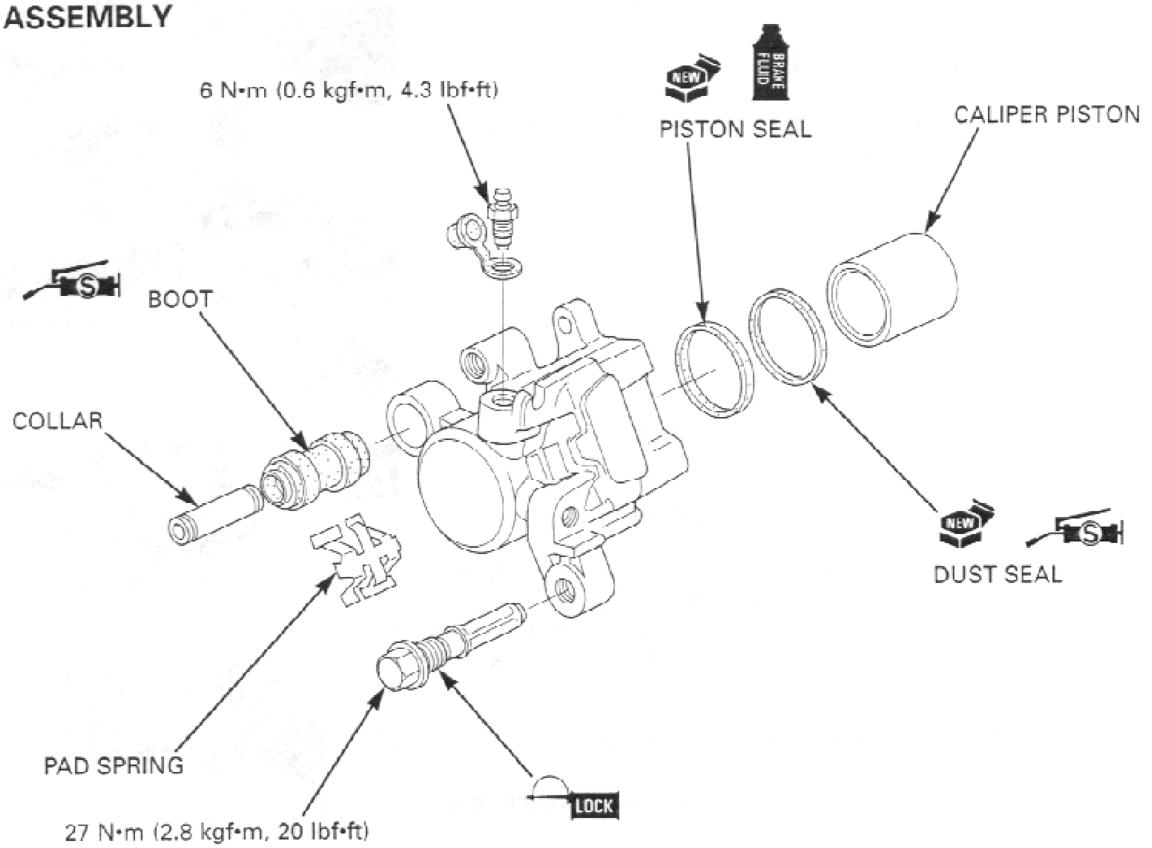
Check the caliper pistons for scratches, scoring or other damage.

Measure the caliper piston O.D.

SERVICE LIMIT: 38.09 mm (1.500 in)



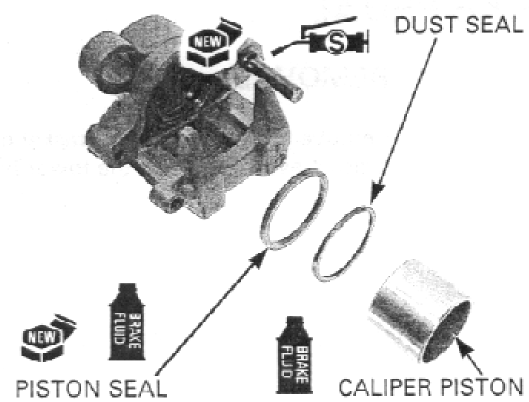
ASSEMBLY



Coat the new piston seal with clean brake fluid.
Coat the new dust seal with silicone grease.

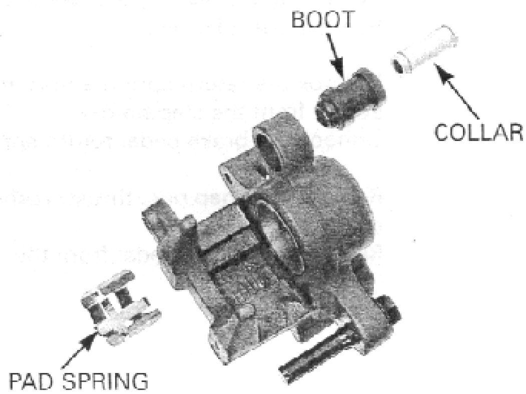
Install the piston seal and dust seal into the groove of the caliper body.

Coat the caliper piston with clean brake fluid and install it into the caliper cylinder with its open end toward the pad.



Install the pad spring into the caliper body.
If the caliper and bracket pin boots are hard or deteriorated, replace them with new ones.

Apply silicone grease to the inside of the bracket pin boot.
Install the bracket pin boot and collar into the caliper.

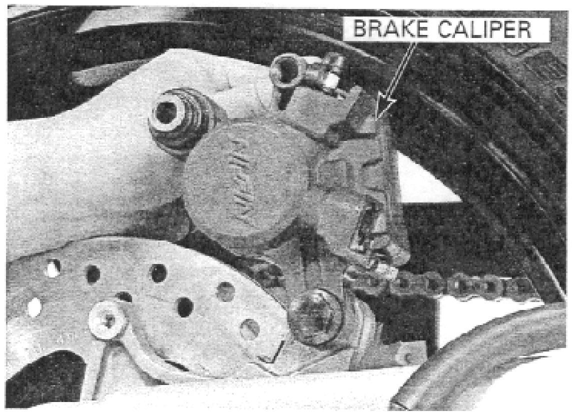


Install the pad retainer into the bracket.

INSTALLATION

Apply silicone grease to the caliper pin and install the caliper onto the bracket.

Install the brake pads (page 15-8).



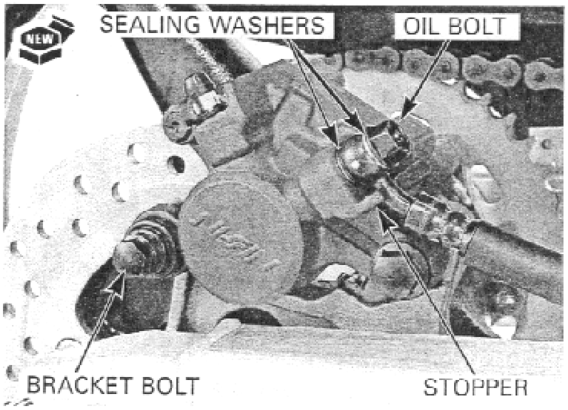
Install and tighten the caliper bracket bolt to the specified torque.

TORQUE: 23 N•m (2.3 kgf•m, 17 lbf•ft)

Install the brake hose eyelet to the caliper body with two new sealing washers and the oil bolt.
Push the brake hose eyelet to the stopper on the caliper, then tighten the oil bolt to the specified torque.

TORQUE: 34 N•m (3.5 kgf•m, 25 lbf•ft)

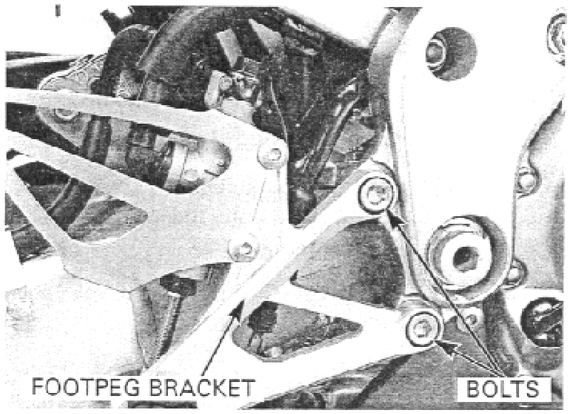
Fill and bleed the rear brake hydraulic system (page 15-4).



BRAKE PEDAL

REMOVAL

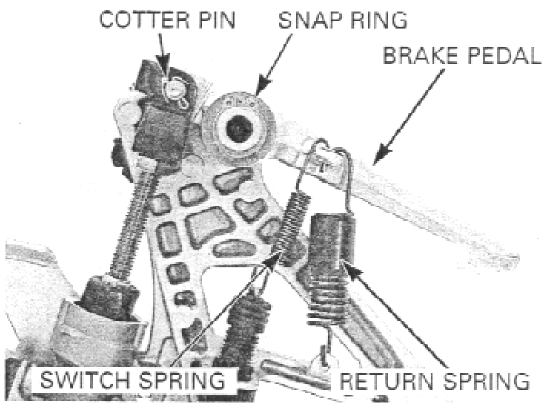
Remove the main footpeg bracket mounting bolts and bracket assembly from the lower bracket.



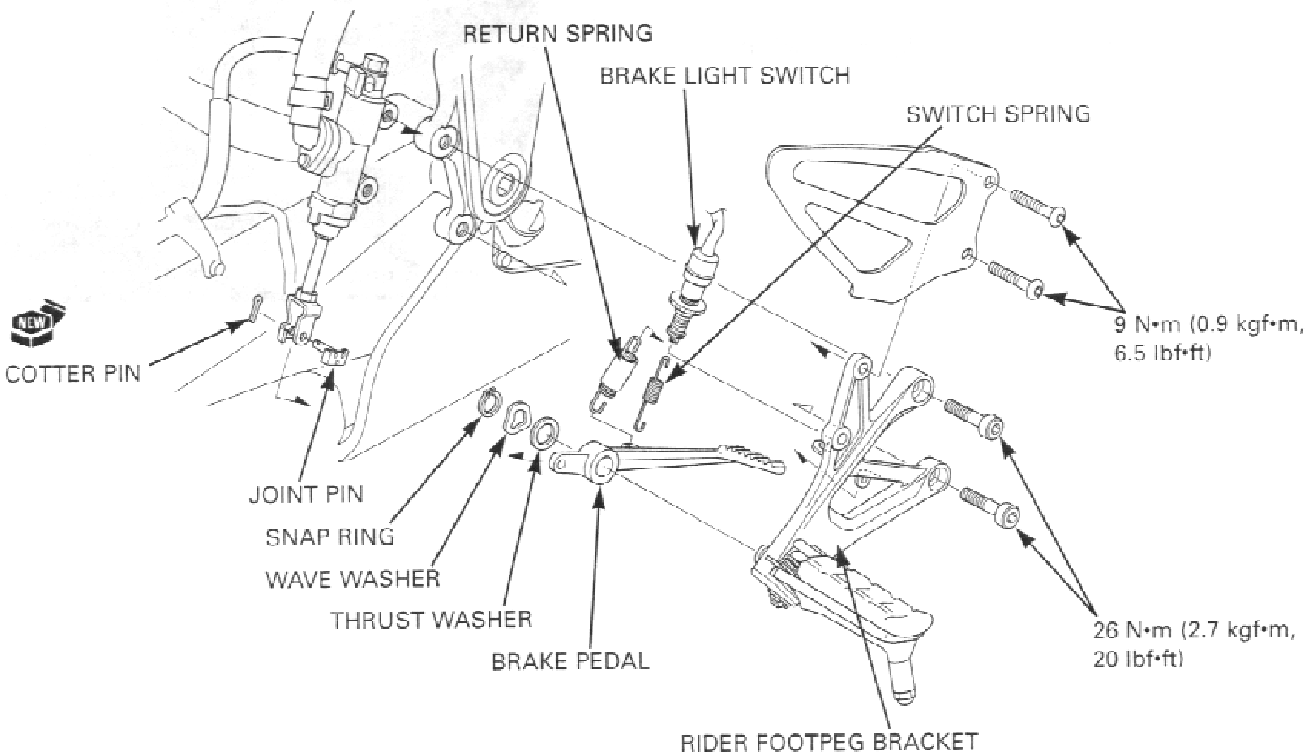
Remove and discard the brake pedal joint cotter pin.
Remove the joint pin.

Unhook the return spring and remove the brake light switch from the step holder.
Unhook the brake pedal return spring.

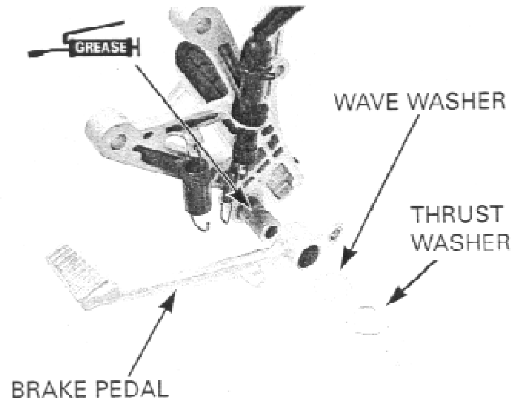
Remove the snap ring, thrust washer, and wave washer.
Remove the brake pedal from the pivot.



INSTALLATION

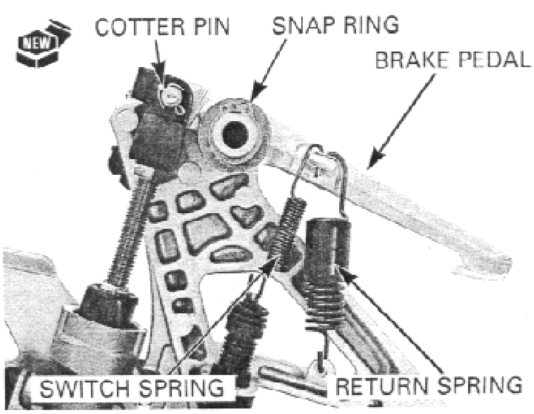


Apply grease to the sliding surface of the brake pedal and footpeg.
Install the brake pedal, wave washer and thrust washer to the pedal pivot.



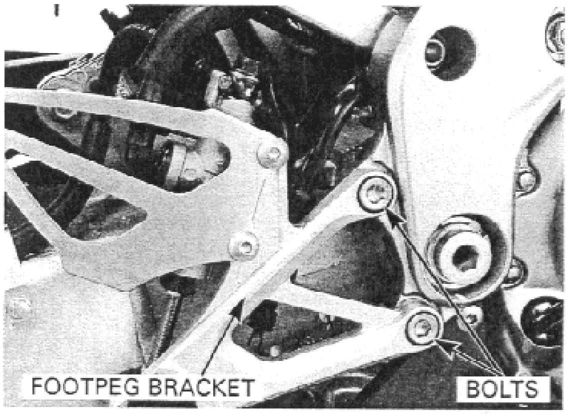
Secure the pedal pivot with a snap ring.

Hook the brake pedal return spring.
Install the brake light switch and hook the switch spring.
Connect the brake pedal to the push rod lower joint.
Install the joint pin and secure it with a new cotter pin.



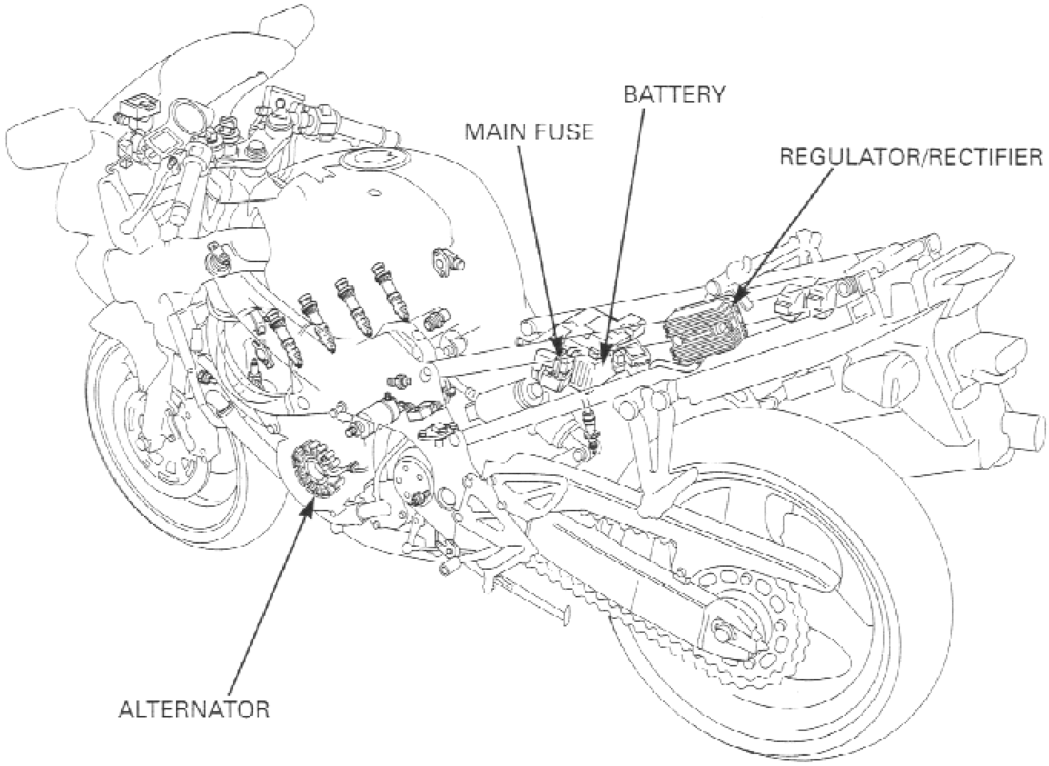
Install the right rider footpeg bracket assembly onto the frame.
Install and tighten the right rider footpeg bracket socket bolts to the specified torque.

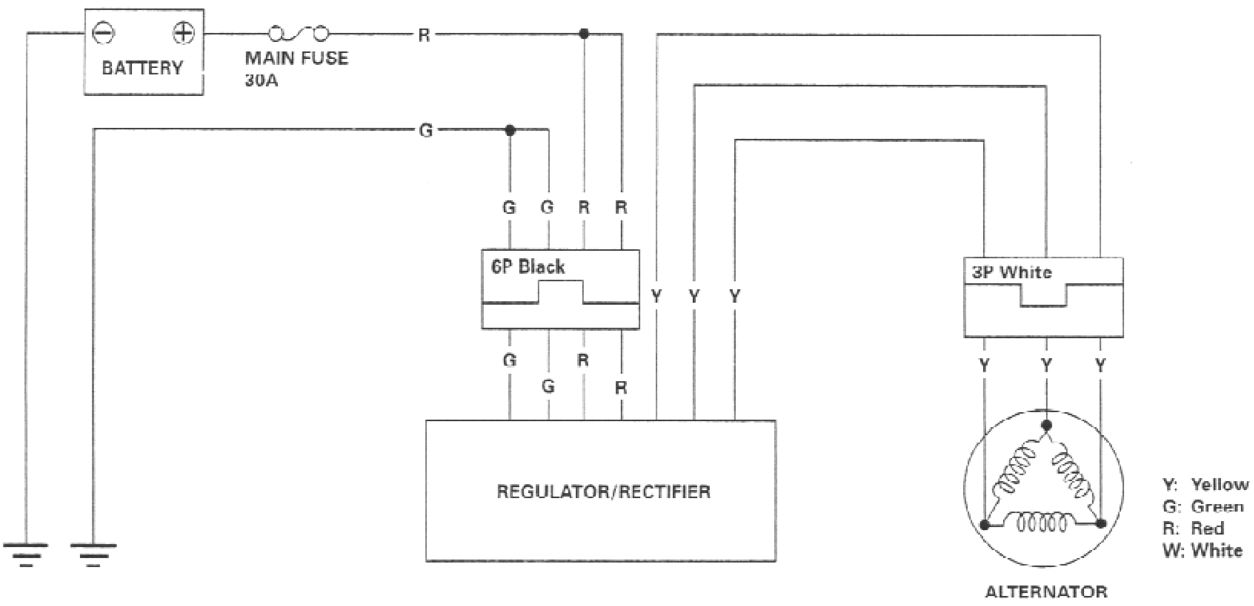
TORQUE: 26 N•m (2.7 kgf•m, 20 lbf•ft)



MEMO

SYSTEM DIAGRAM





16. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION

GENERAL

⚠ WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
  - If electrolyte gets on your skin, flush with water.
  - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
  - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a call a physician immediately.

- Always turn off the ignition switch before disconnecting any electrical component.
- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to "ON" and current is present.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery terminal.
- The maintenance free battery must be replaced when it reaches the end of its service life.
- The battery can be damaged of overcharged or undercharged, or of left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2–3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight on for long periods of time without riding the motorcycle.

- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every 2 weeks to prevent sulfation from occurring.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 16-3).
- For battery charging, do not exceed the charging current and time specified on the battery. Use of excessive current or charging time may damage the battery.

BATTERY TESTING

Refer to the instruction of the Operation Manual for the recommended battery tester. The recommended battery tester puts a "load" on the battery so that the actual battery condition of the load can be measured.

Recommended battery tester **BM210-AH (U.S.A. only), BM-210 or BATTERY MATE or equivalent**

SPECIFICATIONS

ITEM			SPECIFICATIONS
Battery	Capacity		12V – 8.6 Ah
	Current leakage		2.0 mA max.
	Voltage (20°C/68°F)	Fully charged	13.0 – 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	0.9 A/5 – 10 h
		Quick	4.5 A/0.5 h
Alternator	Capacity		0.433 kW/5,000 rpm
	Charging coil resistance (20°C/68°F)		0.1 – 1.0 Ω

TROUBLESHOOTING

BATTERY IS DAMAGED OR WEAK

Remove the battery (page 16-5).
Check the battery condition using the recommended battery tester.

RECOMMENDED BATTERY TESTER:
BM-210 or BATTERY MATE or equivalent

- Incorrect → • Faulty battery.
- Correct ↓

Install the battery (page 16-5).
Check the battery current leakage (leak test; page 16-7).

- Incorrect → Disconnect the regulator/rectifier connector and recheck the battery current leakage.
  - Correct → • Faulty regulator/rectifier.
  - Incorrect → • Shorted wire harness. • Faulty ignition switch.
- Correct ↓

Check the alternator charging coil (page 16-8).

STANDARD: 0.1 – 1.0 Ω (20°C/68°F)

- Incorrect → • Faulty charging coil.
- Correct ↓

Measure and record the battery voltage using a digital multimeter (page 16-5).
Start the engine.
Measure the charging voltage (page 16-8).
Compare the measurement to result of the following calculation.

STANDARD:
Measured battery voltage < Measured charging voltage < 15.5 V

- Correct → • Faulty battery.
- Incorrect ↓

Check the voltage and resistance at the regula tor/rectifier connector (page 16-9).

Incorrect →
- Open circuit in related wire.
- Loose or poor contacts of related terminal.
- Shorted wire harness.

Correct →
- Faulty regulator/rectifier.

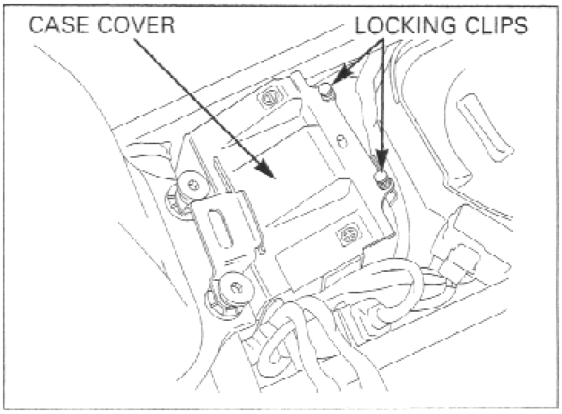
BATTERY

REMOVAL/INSTALLATION

Always turn the ignition switch to "OFF" before removing the battery.

Remove the ECM (page 5-85).

Open the battery case cover by releasing the two locking clips.

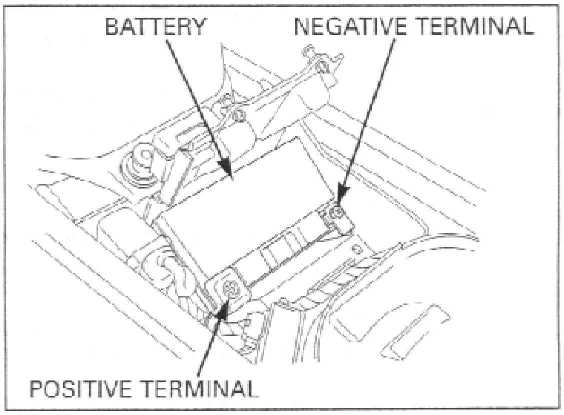


Disconnect the negative cable and then the positive cable, and remove the battery.

Install the battery in the reverse order of removal with the proper wiring as shown.

Connect the positive terminal first and then the negative cable.

After installing the battery, coat the terminals with clean grease.

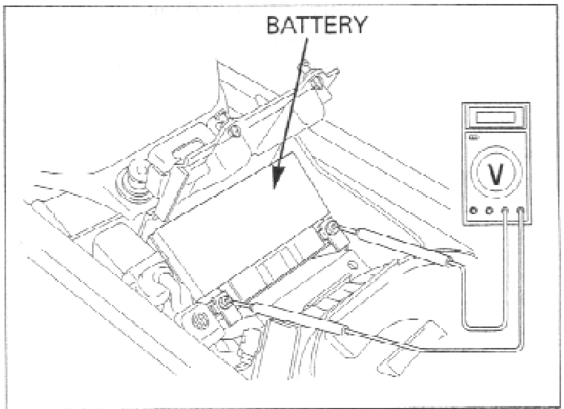


VOLTAGE INSPECTION

Measure the battery voltage using a digital multimeter.

VOLTAGE:
Fully charged: 13.0 – 13.2V
Under charged: Below 12.3V

TOOL:
Digital multimeter **Commercially available**



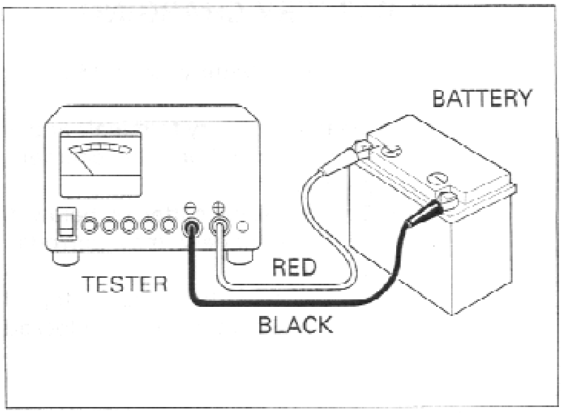
BATTERY TESTING

Always clear the work area of flammable materials such as gasoline, brake fluid, electrolyte, or cloth towels when operating the tester. The heat generated by the tester may cause a fire.

Remove the battery (see above).

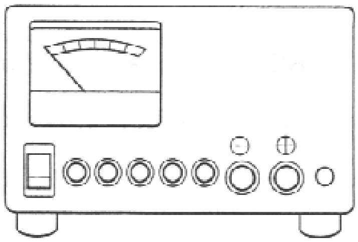
Securely connect the tester's positive (+) cable first, then connect the negative (–) cable.

TOOL:
Battery tester **BM–210–AH (U.S.A. only), BM210 or BATTERY MATE or equivalent**



For accurate test results, be sure the tester's cables and clamps are in good working condition and that a secure connection can be made at the battery.

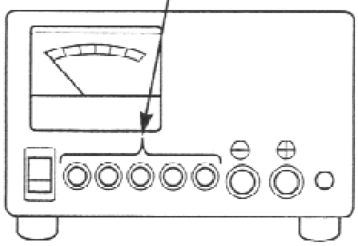
Set the temperature switch to "HIGH" or "LOW" depending on the ambient temperature.



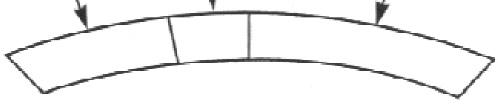
For the first check, DO NOT charge the battery before testing; test it in an "as is" condition.

Push in the appropriate test button for 3 seconds and read the condition of the battery on the meter.

To avoid damaging the tester, only test batteries with an amperage rating of less than 30 Ah.
Tester damage can result from overheating when:
- The test button is pushed in for more than 3 seconds.
- The tester is used without being allowed to cool for at least 1 minute when testing more than one battery.
- More than 10 consecutive tests are performed without allowing at least a 30-minute cool-down period.



The result of a test on the meter scale is relative to the amp. hour rating of the battery. ANY BATTERY READING IN THE GREEN ZONE IS OK. Batteries should only be charged if they register in the YELLOW or RED zone.



BATTERY CHARGING

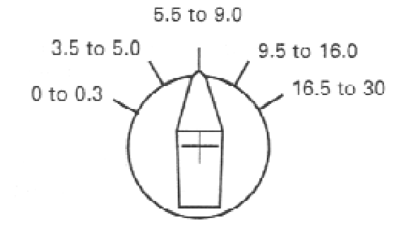
Remove the battery (page 16-5).

- Clean the battery terminals and position the battery as far away from the charger as the leads will permit.
- Do not place batteries below the charger–gases from the battery may corrode and damage the charger.
- Do not place batteries on top of the charger. Be sure the air vents are not blocked.

TOOL:
Christie battery charger **MC1012/2 (U.S.A. only)**

1. Turn the Power Switch to the OFF position.
2. Set the battery Amp. Hr. Selector Switch for the size of the battery being charged.
3. Set the Timer to the position indicated by the Honda Battery Tester; RED-3, RED-2, or YELLOW 1.
   If you are charging a new battery, set the switch to the NEW BATT position.
4. Attach the clamps to the battery terminals; RED to Positive, BLACK to Negative.

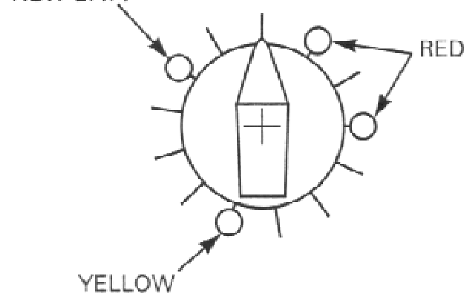
Connect the battery cables only when the Power Switch is OFF.



Set the appropriate amp. hour rating.

The charger will automatically switch to the "Trickle" mode after the set charging time has elapsed.

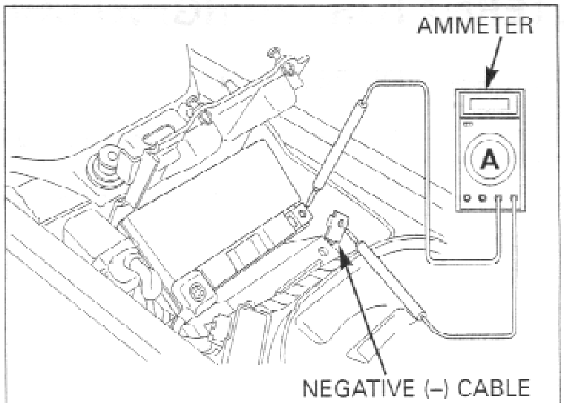
5. Turn the Power Switch to the ON position.
6. When the timer reaches the "Trickle" position, the charging cycle is complete. Turn the Power Switch OFF and disconnect the clamps.
7. Let the battery cool for at least 10 minutes or until gassing subsides after charging.
8. Reset the battery using the Honda Battery Tester and recharge if necessary using the above steps.



CHARGING SYSTEM INSPECTION

CURRENT LEAKAGE INSPECTION

Turn the ignition switch off and disconnect the negative battery cable from the battery.
Connect the ammeter (+) probe to the ground cable and the ammeter (–) probe to the battery (–) terminal.
With the ignition switch off, check for current leakage.



- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition on. A sudden surge of current may blow out the fuse in the tester.

SPECIFIED CURRENT LEAKAGE: 2.0 mA max.

If current leakage exceeds the specified value, a shorted circuit is likely.
Locate the short by disconnecting connections one by one and measuring the current.

CHARGING VOLTAGE INSPECTION

Be sure the battery is in good condition before performing this test.

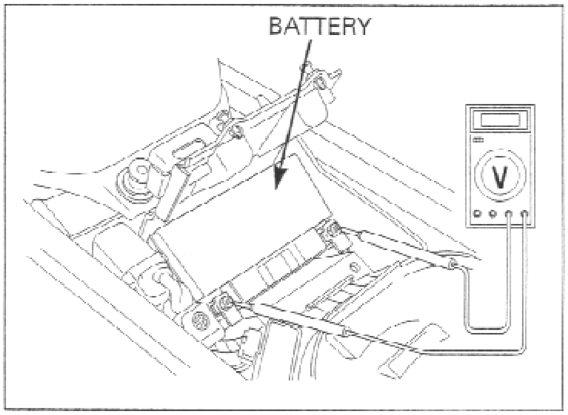
Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

Warm up the engine to normal operating temperature. Stop the engine, and connect the multimeter as shown.

- To prevent a short, make absolutely certain which are the positive and negative terminals or cable.

Restart the engine.
With the headlight turned to the high beam position, measure the voltage on the multimeter when the engine runs at 5,000 rpm.

Standard: Measured battery voltage (page 16-5) < Measured charging voltage (see above) < 15.5 V at 5,000 rpm



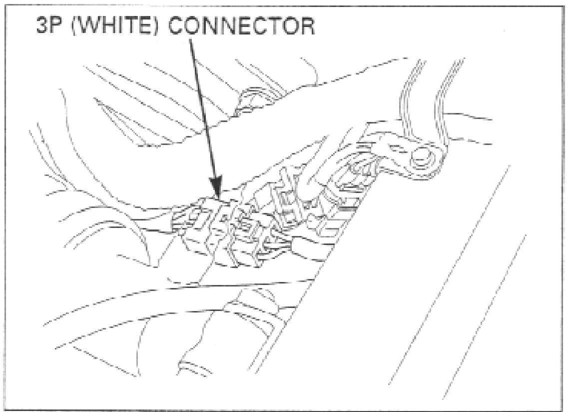
ALTERNATOR CHARGING COIL

INSPECTION

It is not necessary to remove the stator coil to make this test.

Remove the left lower cowl (page 2-4).

Disconnect the alternator 3P (White) connector.

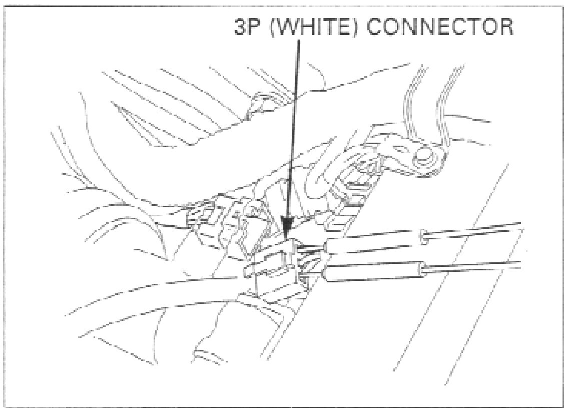


Check the resistance between all three Yellow terminals.

STANDARD: 0.1 – 1.0 Ω (at 20°C/68°F)

Check for continuity between all three Yellow terminals and Ground.
There should be no continuity.

If readings are far beyond the standard, or if any wire has continuity to ground, replace the alternator stator. Refer to section 10 for stator removal.

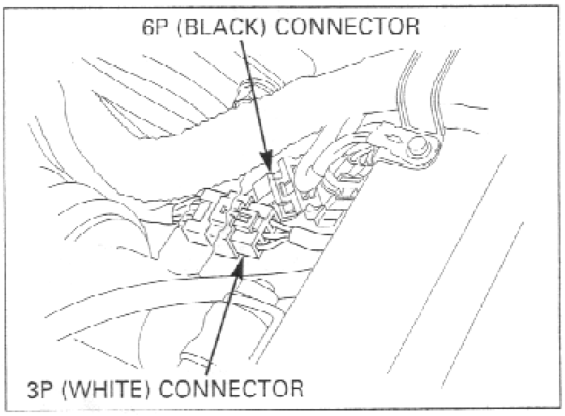


REGULATOR/RECTIFIER

SYSTEM INSPECTION

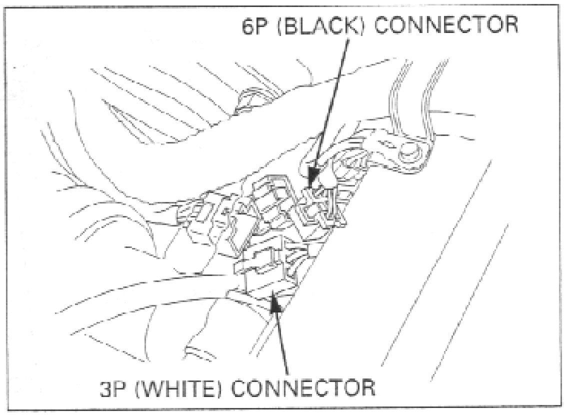
Remove the rear cowl (page 2-2).

Disconnect the regulator/rectifier connectors, and check it for loose contact or corroded terminals.



If the regulated voltage reading (see page 16-6) is out of the specification, measure the voltage between connector terminals (wire harness side) as follows:

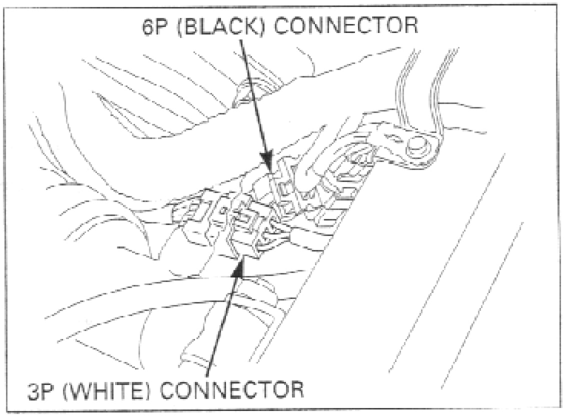
Item	Terminal	Specification
Battery charging line	Red/White (+) and ground (–)	Battery voltage should register
Charging coil line	Yellow and Yellow	0.1 – 1.0 Ω (at 20°C/68°F)
Ground line	Green and ground	Continuity should exist



If all components of the charging system are normal and there are no loose connections at the regulator/rectifier connectors, replace the regulator/rectifier unit.

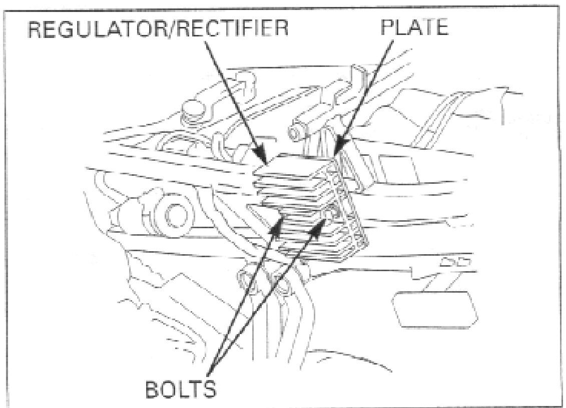
REMOVAL/INSTALLATION

Disconnect the alternator 3P (White) connector.
Disconnect the alternator 6P (Black) connector.

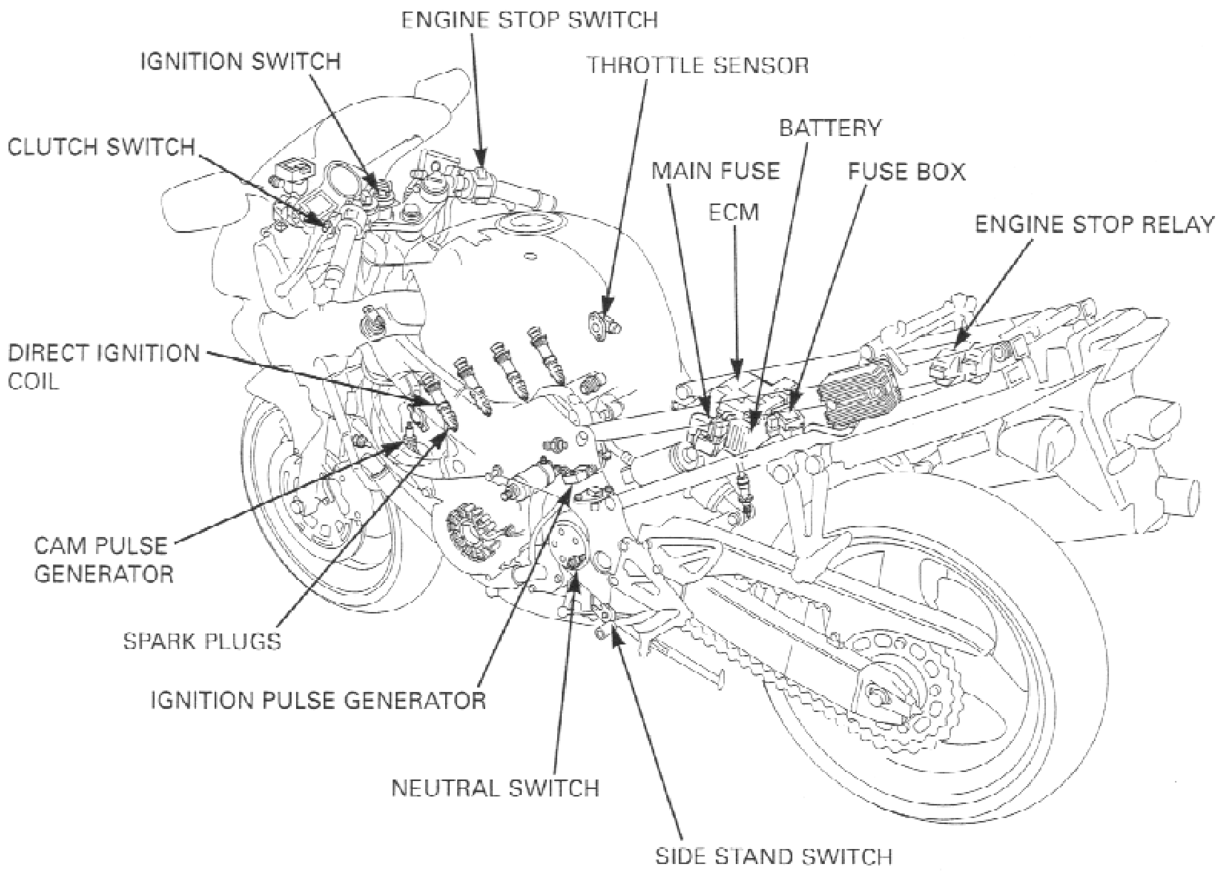


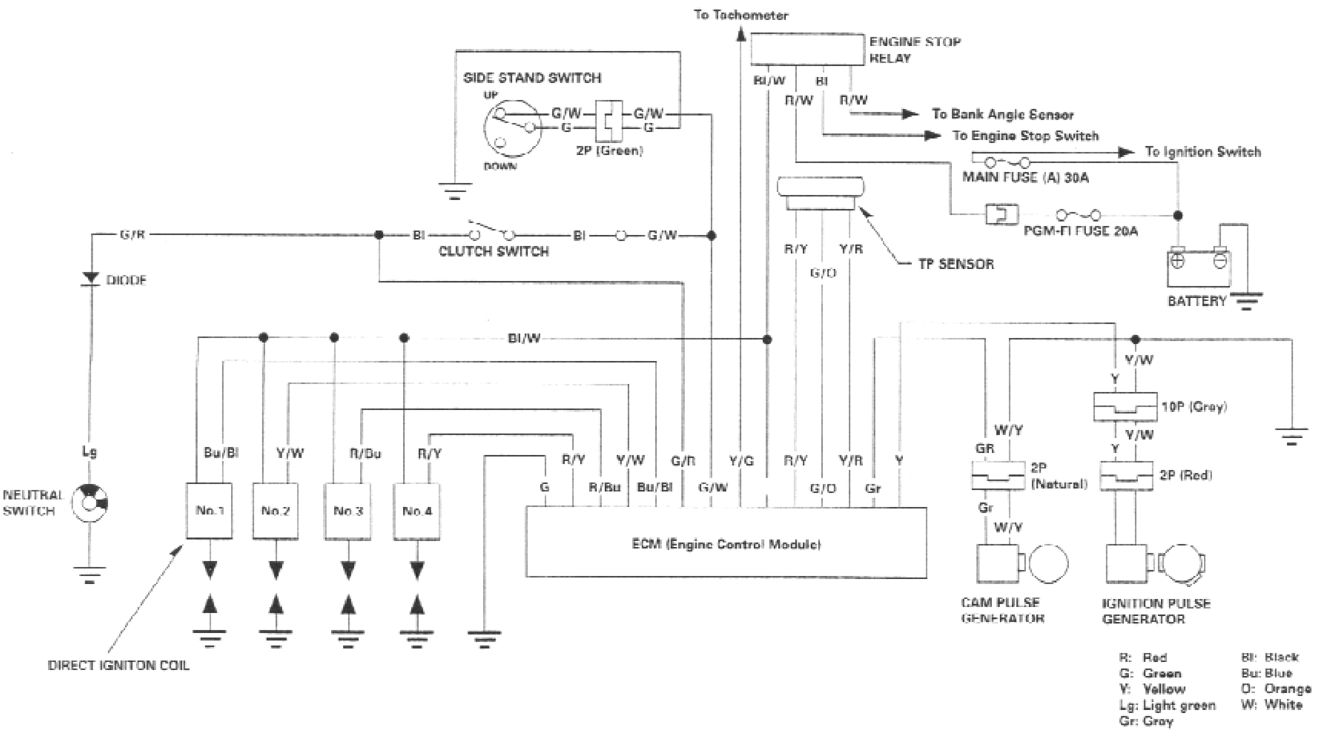
Remove the regulator/rectifier unit mounting bolts, regulator/rectifier and plate.

Install the regulator/rectifier unit in the reverse order of removal.



SYSTEM DIAGRAM





SERVICE INFORMATION

GENERAL

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is turned to "ON" and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting sequence on page 17-3.
- This motorcycle's Ignition Control Module (ICM) is built into the Engine Control Module (ECM).
- The ignition timing does not normally need to be adjusted since the ECM is factory preset.
- The ECM may be damaged if dropped. Also if the connector is disconnected when current is flowing, the excessive voltage may damage the module. Always turn off the ignition switch before servicing.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding. Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plug.
- Use spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.
- The direct ignition coil that the ignition coil and spark plug cap are integrated, is adopted in this motorcycle.
- Refer to section 5 for Throttle Position (TP) sensor, cam pulse generator and ECM inspection.

SPECIFICATIONS

ITEM		SPECIFICATIONS
Spark plug (Iridium)	NGK	IMR9A-9H
	DENSO	IUH27D
Spark plug gap		0.80 – 0.90 mm (0.031 – 0.035 in)
Ignition coil peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		13° BTDC at idle

TORQUE VALUES

Timing hole cap	18 N•m (1.8 kgf•m, 13 lbf•ft)	Apply grease to the threads.
Spark plug	12 N•m (1.2 kgf•m, 9 lbf•ft)	
Ignition pulse generator rotor special bolt	59 N•m (6.0 kgf•m, 43 lbf•ft)	

TOOLS

Peak voltage tester (U.S.A. only) or	
Peak voltage adaptor	07HGJ-0020100 (Not available in U.S.A.) with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

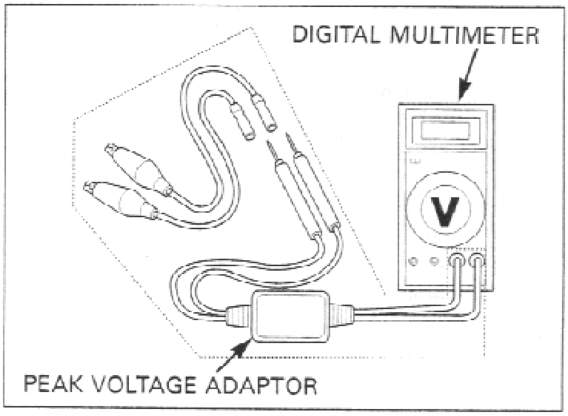
TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose spark plug cap or spark plug wire connection
  - Water got into the direct ignition coil (leaking the ignition coil secondary voltage)
- If there is no spark at either cylinder, temporarily exchange the direct ignition coil with the a known-good one and perform the spark test. If there is spark, the exchanged direct ignition coil is faulty.
- "Initial voltage" of the ignition primary coil is the battery voltage with the ignition switch turned to "ON" and the engine stop switch turned on (the engine is not cranked by the starter motor).

No spark at all plugs

Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	No initial voltage with ignition and engine stop switches turned on (other electrical components are normal).	1. Faulty engine stop switch. 2. An open circuit in Black/White wire between the direct ignition coil and engine stop switch. 3. Loose or poor connect of the direct ignition coil primary wire terminal, or an open circuit in primary coil (check at the ECM connector). 4. Faulty ECM (in case when the initial voltage is normal while disconnecting ECM connector)
	Initial voltage is normal, but it drops down to 2 – 4 V while cranking the engine.	1. Incorrect peak voltage adaptor connections. 2. Undercharged battery. 3. No voltage between the Black/White (+) and body ground (–) at the ECM multi-connector or loosen ECM connection. 4. An open circuit or loose connection in Green wire. 5. An open circuit or loose connection in Blue/Black, Yellow/White, Red/Blue and Red/Yellow wires between the direct ignition coils and ECM. 6. Short circuit in ignition primary coil. 7. Faulty side stand switch or neutral switch. 8. An open circuit or loose connection in No.7 related circuit wires. • Side stand switch line: Green/White wire • Neutral switch line: Light Green wire 9. Faulty ignition pulse generator (measure the peak voltage). 10. Faulty ECM (in case when above No. 1 – 9 are normal).
	Initial voltage is normal, but no peak voltage while cranking the engine.	1. Faulty peak voltage adaptor connections. 2. Faulty peak voltage adaptor. 3. Faulty ECM (in case when above No.1, 2 are normal).
	Initial voltage is normal, but peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (battery undercharged). 3. The sampling timing of the tester and measured pulse were not synchronised (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty ECM (in case when above No. 1 – 3 are normal).
	Initial and peak voltage are normal, but does not spark.	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil (s).
Ignition pulse generator	Peak voltage is lower than standard value.	1. The multimeter impedance is too low; below 10 MΩ/DCV. 2. Cranking speed is too low (battery undercharged). 3. The sampling timing of the tester and measured pulse were not synchronised (system is normal if measured voltage is over the standard voltage at least once). 4. Faulty ECM (in case when above No. 1 – 3 are normal).
	No peak voltage.	1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

IGNITION SYSTEM INSPECTION

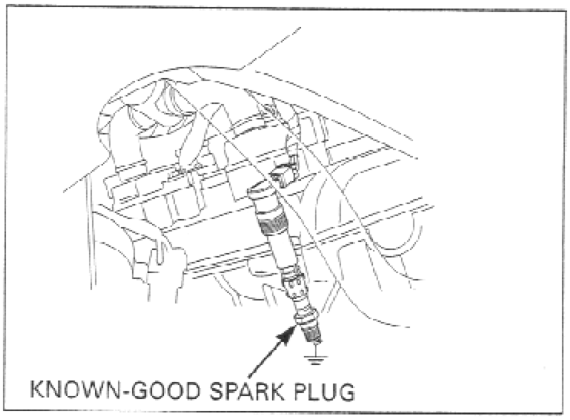


- If there is no spark at any plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use the recommended digital multimeter or commercially available digital multimeter with an impedance of 10 MΩ/DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.
- If the peak voltage tester (U.S.A. only) is used, follow the manufacturer's instruction.

Connect the peak voltage tester or peak voltage adaptor to the digital multimeter.

TOOLS:
Peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ–0020100
(not available in U.S.A.)
with commercially available digital multimeter
(impedance 10 MΩ/DCV minimum)

IGNITION COIL PRIMARY PEAK VOLTAGE

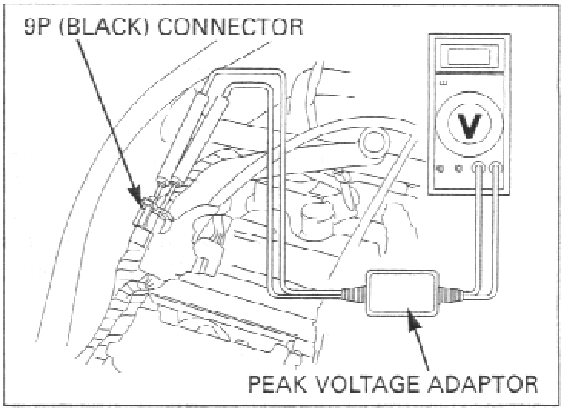


- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

Disconnect the direct ignition coils from the spark plugs (page 3-6).

Connect the direct ignition coil 2P connectors to the direct ignition coil.
Shift the transmission into neutral.
Connect known-good spark plugs to the direct ignition coils and ground the spark plugs to the cylinder head as done in the spark test.

With the ignition coil sub-harness 9P (Black) connector connected, connect the peak voltage adaptor or peak voltage tester to the 9P (Black) connector primary wire terminal and ground.



CONNECTION:
- **No.1 coil:**
  - **Blue/Black terminal (+) – Body ground (–)**
- **No.2 coil:**
  - **Yellow/White terminal (+) – Body ground (–)**
- **No.3 coil:**
  - **Red/Blue terminal (+) – Body ground (–)**
- **No.4 coil:**
  - **Red/Yellow terminal (+) – Body ground (–)**

Avoid touching the spark plugs and tester probes to prevent electric shock.

Turn the ignition switch to "ON" and the engine stop switch on.
Check for initial voltage at this time.
The battery voltage should be measured.
If the initial voltage cannot be measured, check the power supply circuit (refer to the troubleshooting, page 17-3).

Crank the engine with the starter motor and read the ignition coil primary peak voltage.

PEAK VOLTAGE: 100 V minimum

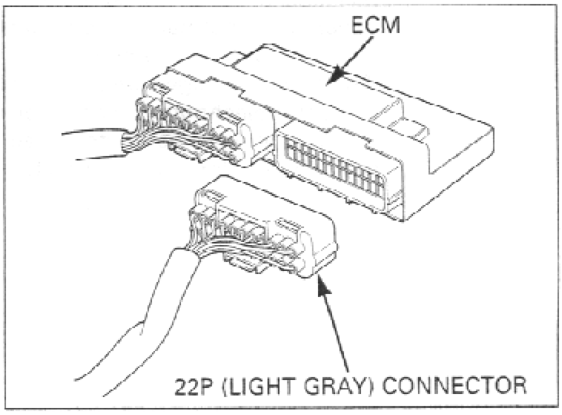
If the peak voltage is abnormal, check for an open circuit or poor connection in the Blue/Black, Yellow/White, Red/Blue and Red/Yellow wires.
If no defects are found in the harness, refer to the troubleshooting chart on page 17-3.

IGNITION PULSE GENERATOR PEAK VOLTAGE

- Check all system connections before inspection. If the system is disconnected, incorrect peak voltage might be measured.
- Check cylinder compression and check that the spark plugs are installed correctly.

Remove the following:
- Seat (page 2-2)
- Lower cowl (page 2-4)

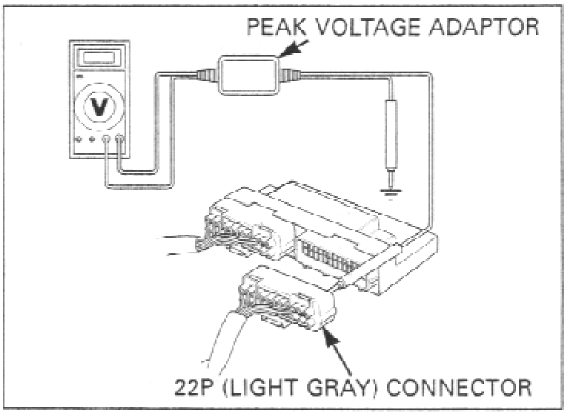
Disconnect the 22P (Light gray) connector from the ECM.



Connect the peak voltage tester or peak voltage adaptor probes to the connector terminal of the wire harness side and ground.

TOOLS:
Peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ–0020100
(not available in U.S.A.)
with commercially available digital multimeter
(impedance 10 MΩ/DCV minimum)

CONNECTION:
Yellow terminal (+) – Ground (–)

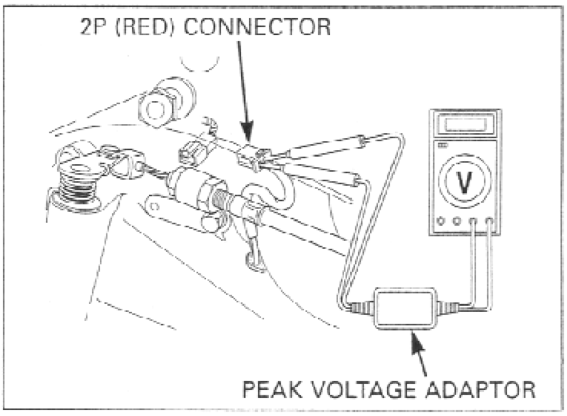


Avoid touching the spark plugs and tester probes to prevent electric shock.

Crank the engine with the starter motor and read the peak voltage.

PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at ECM multi-connector is abnormal, measure the peak voltage at the ignition pulse generator connector.



Disconnect the ignition pulse generator 2P (Red) connector and connect the tester probes to the terminal (Yellow and White/Yellow).
In the same manner as at the ECM connector, measure the peak voltage and compare it to the voltage measured at the ECM connector.

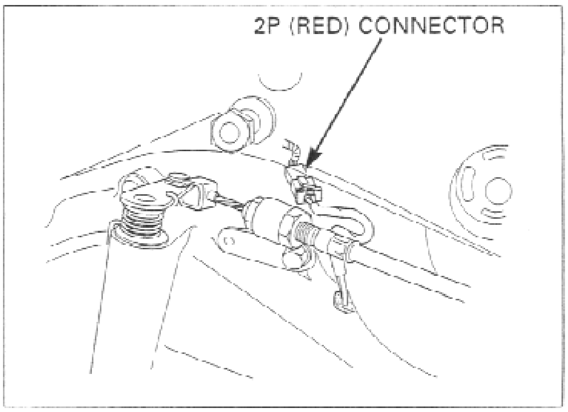
- If the peak voltage measured at the ECM is abnormal and the one measured at the ignition pulse generator is normal, the wire harness has an open circuit or loose connection.
- If both peak voltages are abnormal, check each item in the troubleshooting chart. If all items are normal, the ignition pulse generator is faulty. See following steps for ignition pulse generator replacement.

IGNITION PULSE GENERATOR

REMOVAL

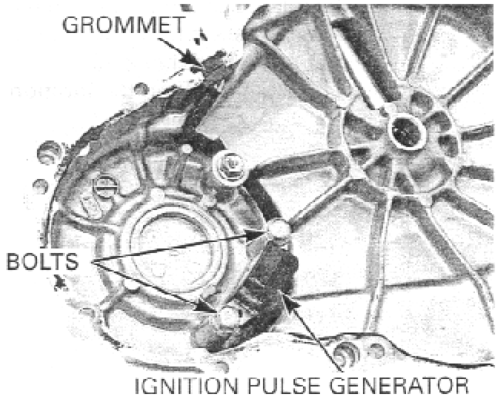
Remove the lower cowl (page 2-4).

Disconnect the ignition pulse generator 2P (Red) connector.



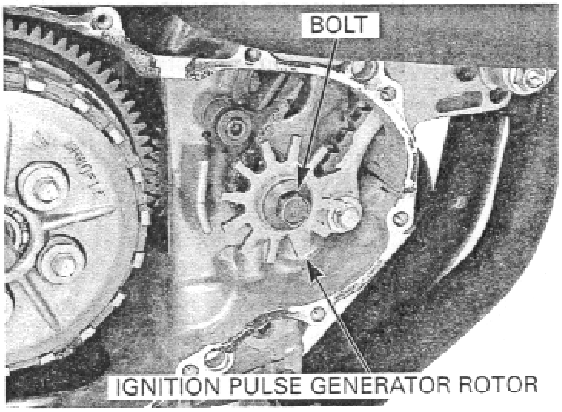
Remove the right crankcase cover (page 9-3).

Remove the wire grommet from the cover.
Remove the bolts and ignition pulse generator.



If the engine is out of the frame, remove the alternator cover (page 10-2) and hold the flywheel with the flywheel holder (P/N: 07725–0040000), then remove the bolt.

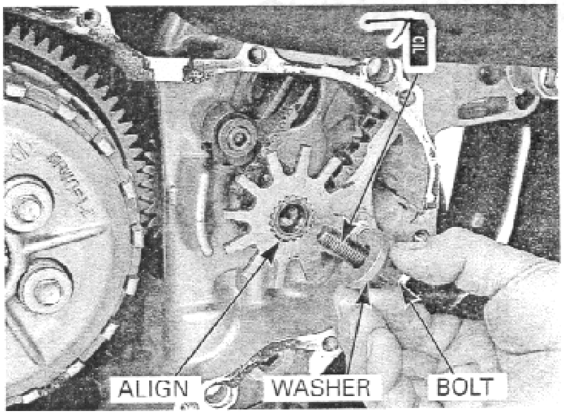
Shift the transmission into 6th gear and apply the rear brake.
Remove the ignition pulse generator rotor bolt.



INSTALLATION

Install the ignition pulse generator rotor by aligning the wide groove with the wide teeth of the crankshaft.

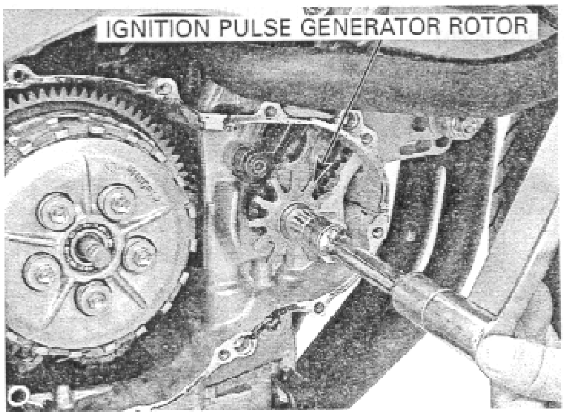
Apply oil to the ignition pulse generator rotor bolt threads, then install the washer and rotor bolt.



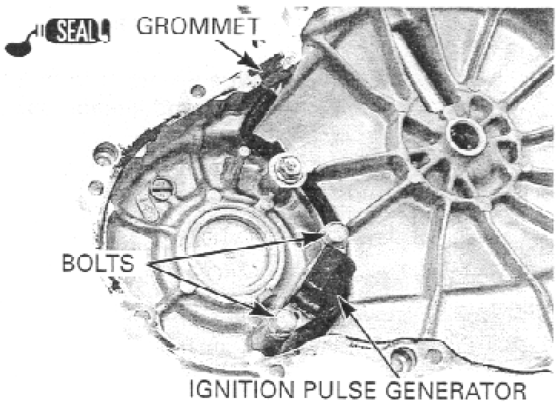
If the engine is out of frame, remove the alternator cover (page 10-2) and hold the flywheel with the flywheel holder (P/N: 07725–0040000), then tighten the bolt.

Shift the transmission into 6th gear and apply the rear brake.
Tighten the ignition pulse generator rotor bolt to the specified torque.

TORQUE: 59 N·m (6.0 kgf·m, 43 lbf·ft)



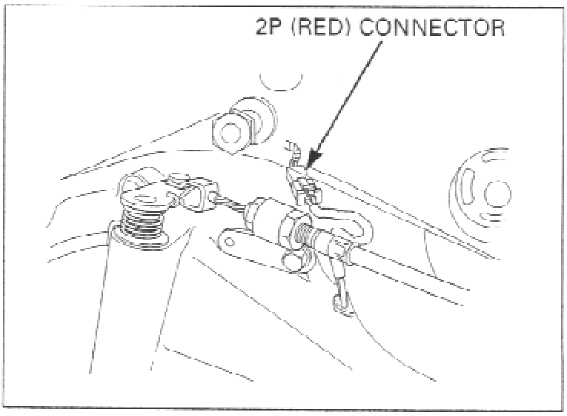
Install the ignition pulse generator into the cover.
Apply sealant to the wire grommet, then install it into the groove of the cover.
Install and tighten the ignition pulse generator bolts.



Install the right crankcase cover (page 9-17).

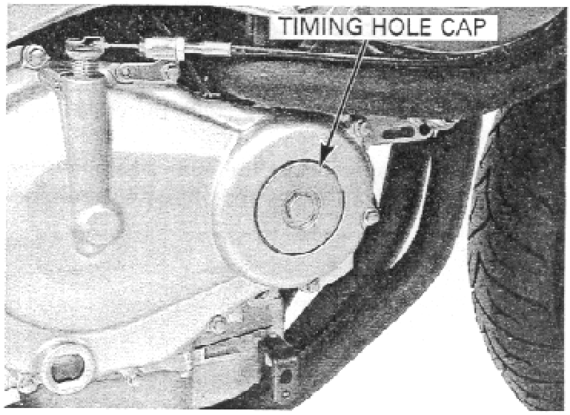
Route the ignition pulse generator wire properly, connect the 2P (Red) connector.

Install the removed parts in the reverse order of removal.



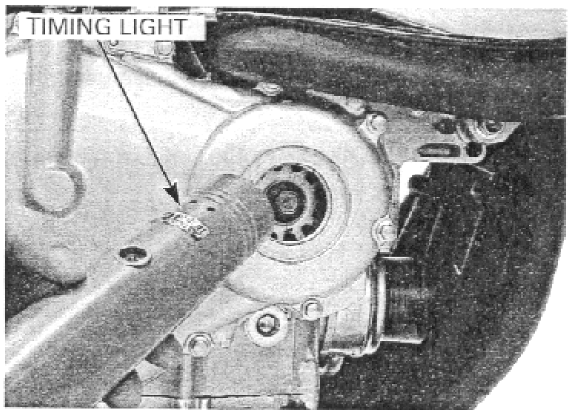
IGNITION TIMING

Warm up the engine.
Stop the engine and remove the timing hole cap.



Read the instructions for timing light operation.

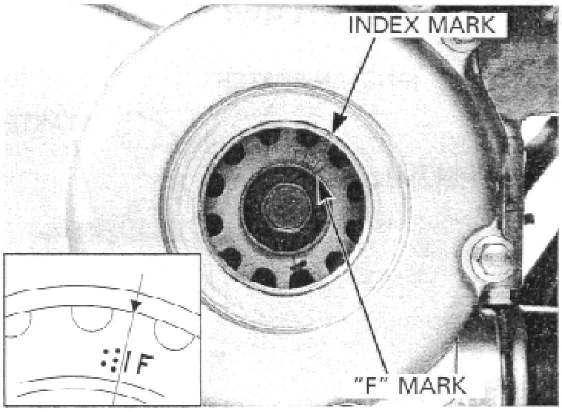
Connect the timing light to the No.1 spark plug wire.



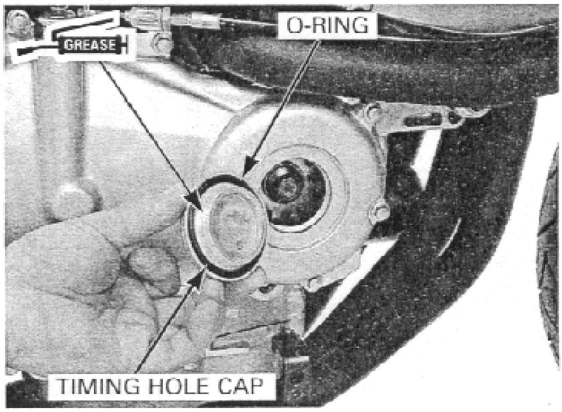
Start the engine and let it idle.

IDLE SPEED: 1,300 ± 100 rpm

The ignition timing is correct if the index mark on the right crankcase cover aligns between the "F" mark and the three punch marks on the ignition pulse generator rotor as shown.

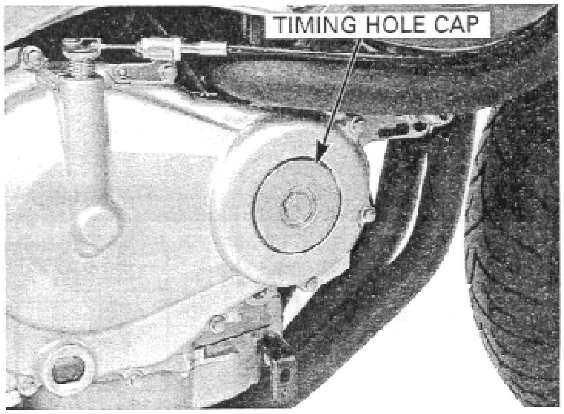


Check that the O-ring is in good condition, replace if necessary.
Apply grease to the timing hole cap threads and install the O-ring and timing hole cap.

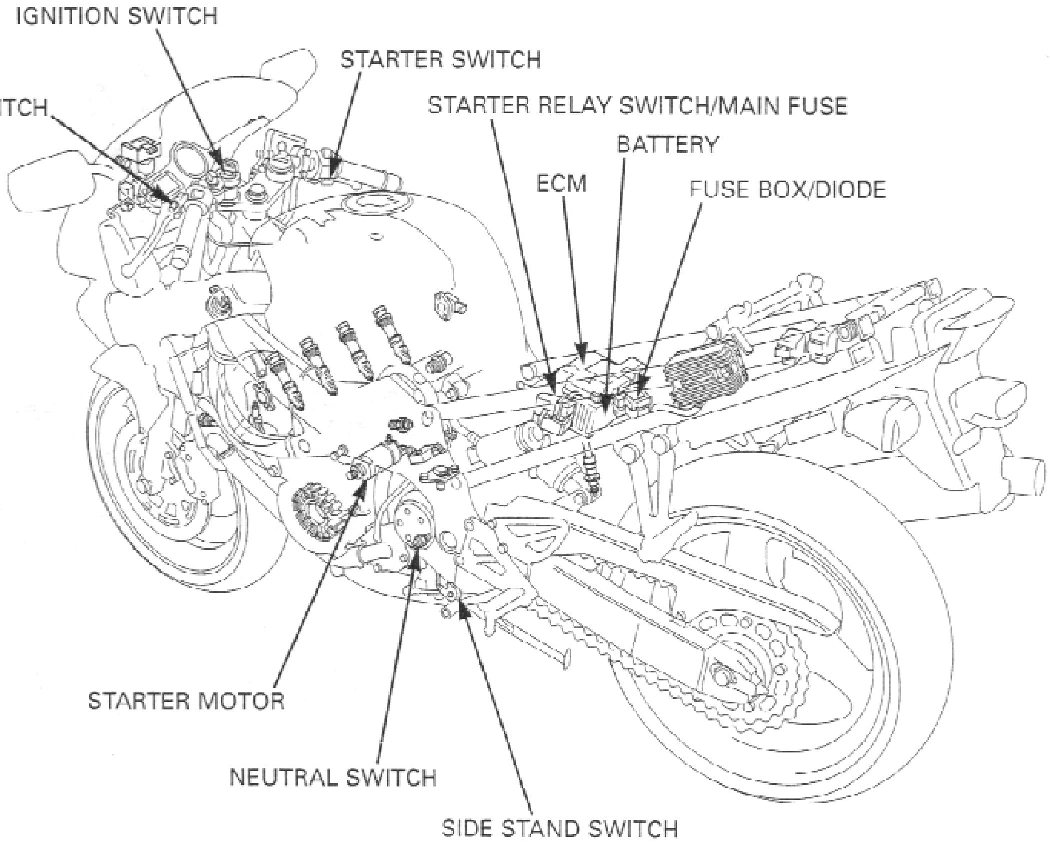


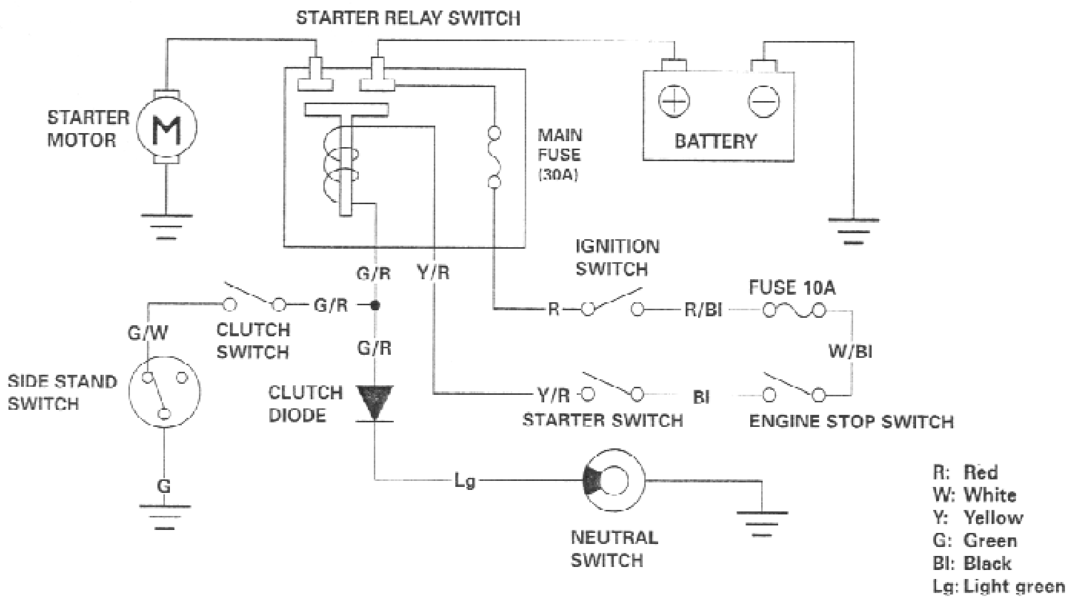
Tighten the timing hole cap to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)



SYSTEM DIAGRAM





SERVICE INFORMATION

GENERAL

- Always turn the ignition switch to "OFF" before servicing the starter motor. The motor could suddenly start, causing serious injury.
- When checking the starter system, always follow the steps in the troubleshooting flow chart (page 18-2).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- See section 10 for starter clutch servicing.
- See section 19 for following components:
  - Ignition switch
  - Engine stop switch
  - Starter switch
  - Neutral switch
  - Side stand switch
  - Clutch switch

SPECIFICATION

Unit: mm (in)

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0 – 13.0 (0.47 – 0.51)	6.5 (0.26)

TORQUE VALUE

Starter motor terminal nut — 12 N•m (1.2 kgf•m, 9 lbf•ft)

18

TROUBLESHOOTING

Starter motor does not turn

- Check for blown main or sub fuses before servicing.
- Make sure the battery is fully charged and in good condition.

Check the starter relay switch operation.
You should hear the relay click when the starter switch button is depressed.

→ Click heard → Apply battery voltage to the starter motor directly and check the operation.

- Normal →
  - Poorly connected starter motor cable.
  - Faulty starter relay switch (page 18-10).
- Abnormal →
  - Faulty starter motor (page 18-4).

↓ Click not heard

Disconnect the starter relay switch connector, and check the relay coil ground wire lines for continuity as stated below:

1. Green/Red terminal-clutch switch diode-neutral switch line (with the transmission in neutral and clutch lever released).
2. Green/Red terminal/clutch switch-side stand switch line (in any gear except neutral, and with the clutch lever pulled in and the side stand up).

→ Abnormal →

- Faulty neutral switch (page 19-20)
- Faulty neutral diode
- Faulty clutch switch
- Faulty clutch/side stand diode
- Faulty side stand switch
- Loose or poor contact connector
- Open circuit in wire harness

↓ Normal

Connect the starter relay switch connector.
With the ignition switch turned to "ON" and the starter switch pushed, measure the starter relay voltage at the starter switch connector (between Yellow/Red (+) and ground (–).

→ No voltage →

- Faulty ignition switch.
- Faulty starter switch.
- Blown out main or sub-fuse.
- Loose or poor contact of connector.
- Open circuit in wire harness.

↓ Battery voltage registered

Check the starter relay switch operation.

→ Normal →

- Loose or poor contact starter relay switch connector.

↓ Abnormal →

- Faulty starter relay switch.

The starter motor turns when the transmission is in neutral, but does not turn with the transmission in any position except neutral, with the side stand up and the clutch lever pulled in.

Check the clutch switch operation. — Normal → • Faulty clutch switch.

Normal ↓

Check the side stand switch. — Normal → • Faulty clutch switch.

Normal →
- Open circuit in wire harness.
- Loose or poor contact connector.

Starter motor turns engine slowly
- Low battery voltage
- Poorly connected battery terminal cable
- Poorly connected starter motor cable
- Faulty starter motor
- Poor connected battery ground cable

Starter motor turns, but engine does not turn
- Starter motor is running backwards
  - Case assembled improperly
  - Terminals connected improperly
- Faulty starter clutch
- Damaged or faulty starter drive gear

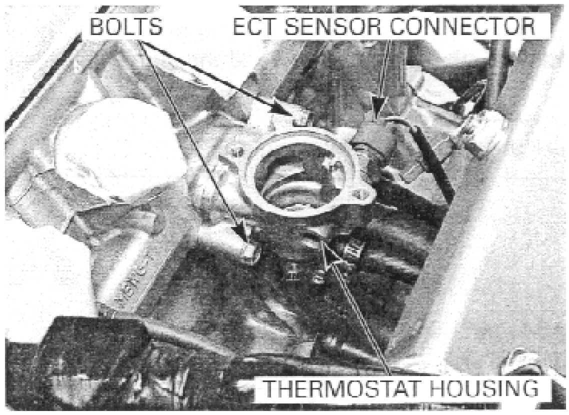
Starter relay switch "Clicks", but engine does not turn over
- Crankshaft does not turn due to engine problems

STARTER MOTOR

REMOVAL

Support the front end of fuel tank (page 3-4).
Drain the coolant (page 6-4).
Remove the throttle body (page 5-60).
Remove the thermostat housing (page 6-7).

With the ignition switch turned to "OFF", remove the negative cable at the battery before servicing the starter motor.

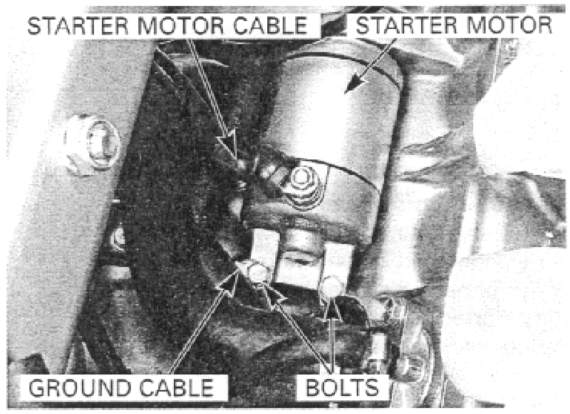


Be careful not to damage the water hose.

Remove the nut and the starter motor cable from the starter motor.

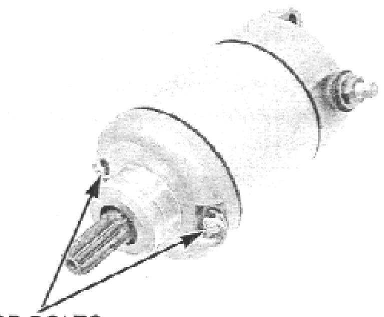
Remove the starter motor mounting bolts and ground cable.

Pull the starter motor out of the crankcase.



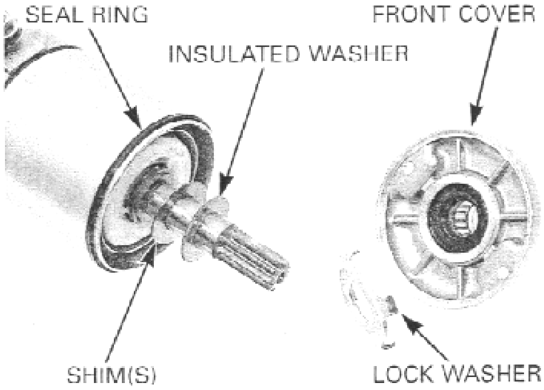
DISASSEMBLY

Remove the following:
- Starter motor case bolts/O-rings

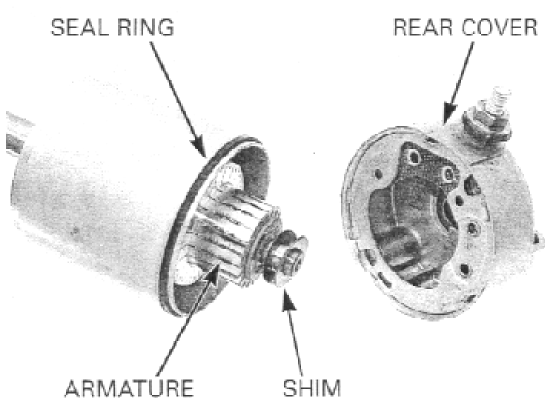


Record the location and number of shims.

- Front cover
- Seal ring
- Lock washer
- Insulated washer
- Shim(s)

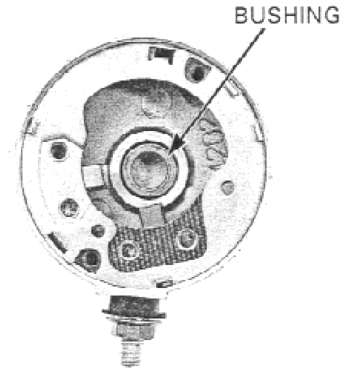


Remove the following:
- Rear cover assembly
- Seal ring
- Shims
- Armature

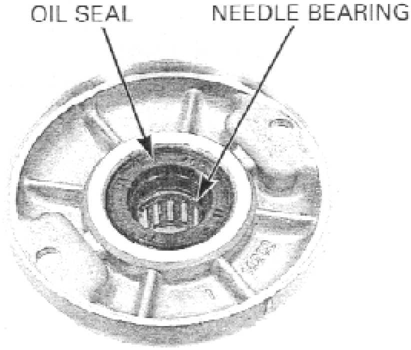


INSPECTION

Check the bushing in the rear cover for wear or damage.

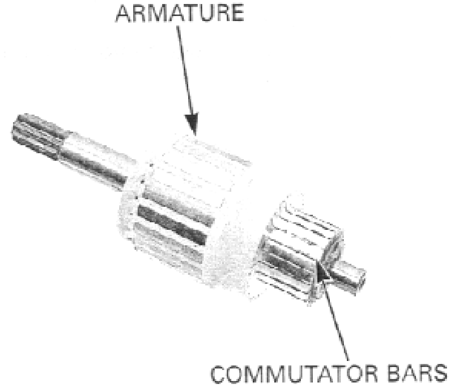


Check the oil seal and needle bearing in the front cover for deterioration, wear or damage.

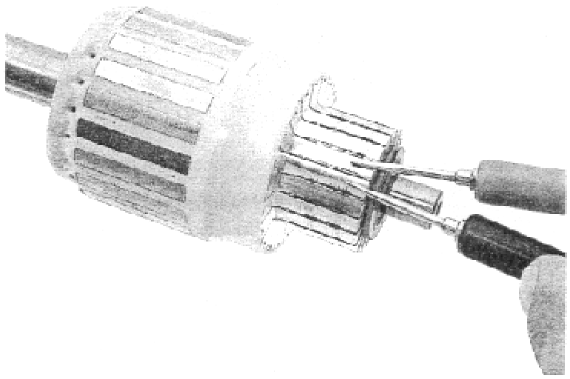


Do not use emery cloth or sand paper on the commutator.

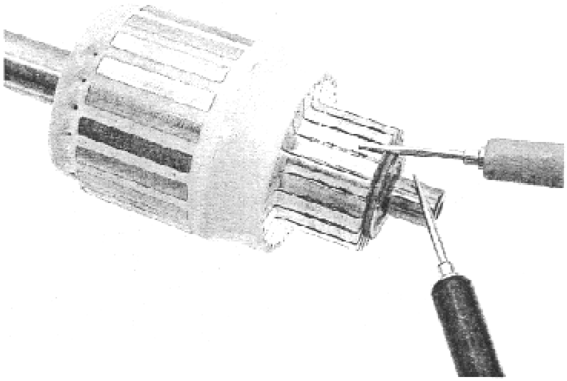
Check the commutator bars of the armature for discoloration.



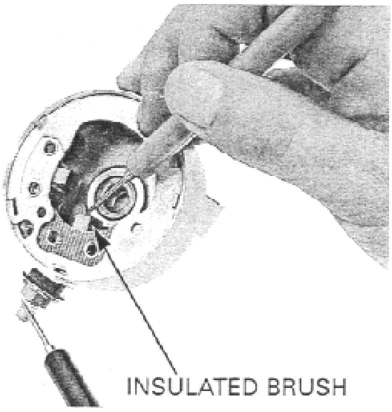
Check for continuity between the pairs of commutator bars.
There should be continuity.



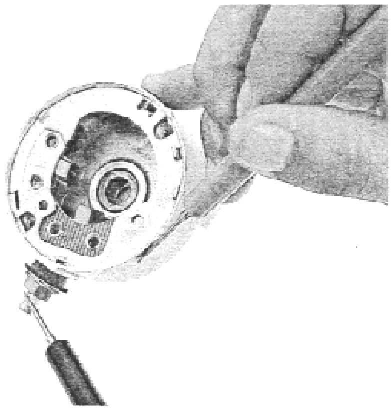
Check for continuity between each commutator bar and the armature shaft.
There should be no continuity.



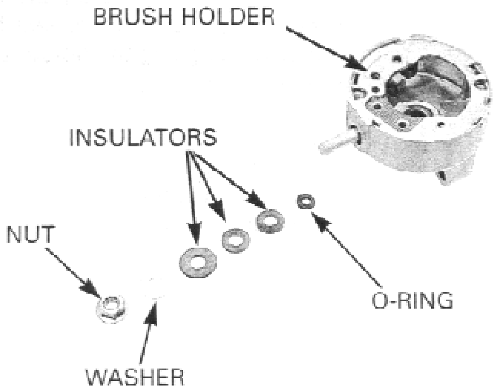
Check for continuity between the insulated brush and cable terminal (the indigo colored wire or the insulated brush holder).
There should be continuity.



Check for continuity between the cable terminal and the rear cover.
There should be no continuity.

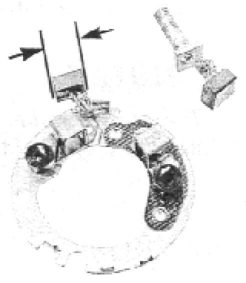


Remove the following:
- Nut
- Washer
- Insulators
- O-ring
- Brush holder assembly
- Brush/terminal

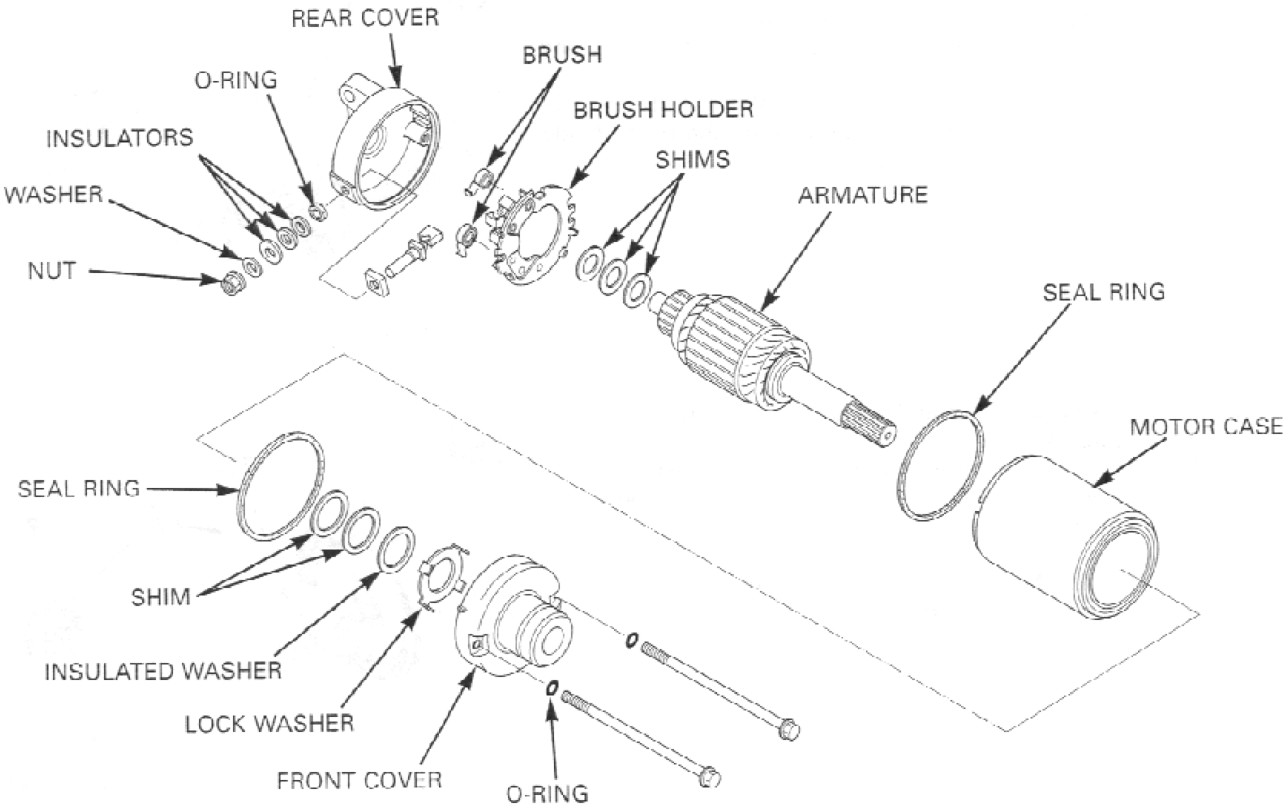


Inspect the brushes for damage and measure the brush length.

SERVICE LIMIT: 6.5 mm (0.26 in)

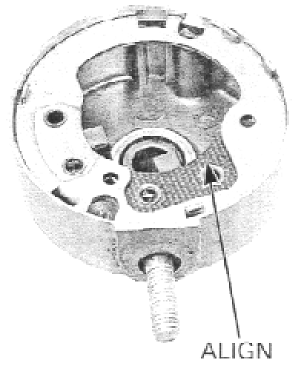


ASSEMBLY



Install the brushes into the brush holder.
Install the cable terminal and brush holder into the rear cover, aligning the holder tab with the rear cover groove.

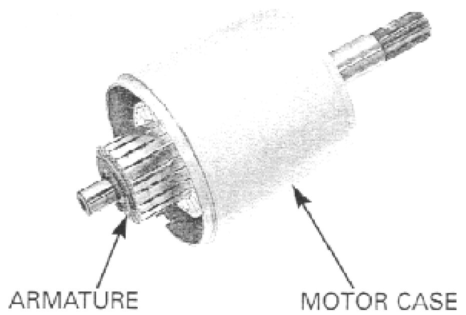
Install the following:
- New O-ring
- Insulated washers
- Washer
- Nut



Install the armature in the motor case.
When installing the armature into the motor case, hold the armature tightly to prevent the magnet from pulling the armature against the case.

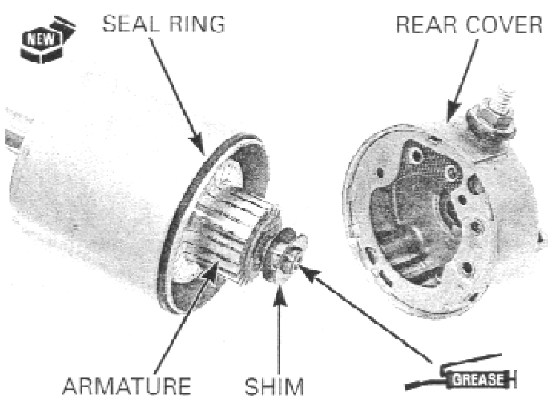
NOTICE

The coil may be damaged if the magnet pulls the armature against the case.



Install the same number of shims in the same location as noted during disassembly.
Install a new seal ring onto the motor case.
Apply a thin coat of grease to the armature shaft end.

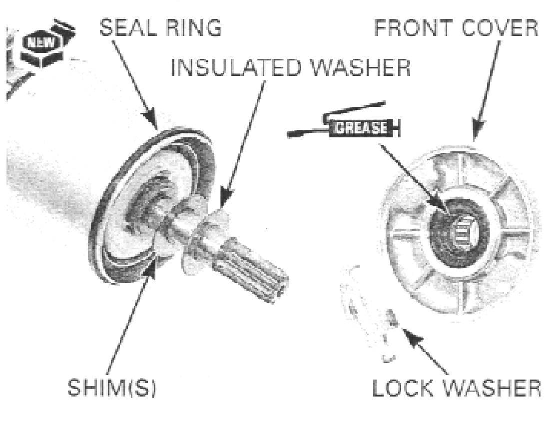
Install the rear cover, while pushing in the brushes into the brush holder and aligning the brush holder tab with the motor case groove.



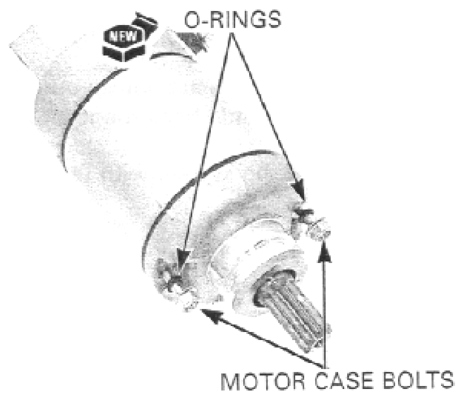
Install the shims properly as noted during removal.

Install the shims and insulated washer onto the armature shaft.
Install a new seal ring onto the motor case.
Apply grease to the oil seal lip and needle bearing in the front cover.

Install the lock washer onto the front cover.
Install the front cover.

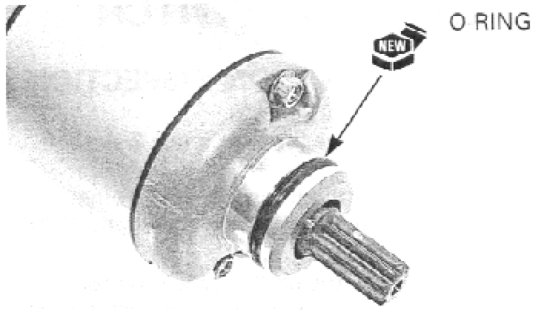


Install new O-rings onto the motor case bolts.
Install and tighten the case bolts securely.



INSTALLATION

Coat a new O-ring with oil and install it into the starter motor groove.



Install the starter motor into the crankcase.

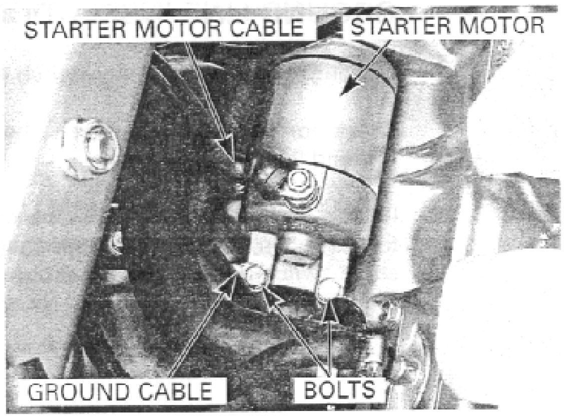
Route the starter motor cable and ground cable.
Install the ground cable and mounting bolts, and tighten the bolts securely.

Be careful not to damage the water hose.

Install the starter motor cable, then tighten the terminal nut to the specified torque.

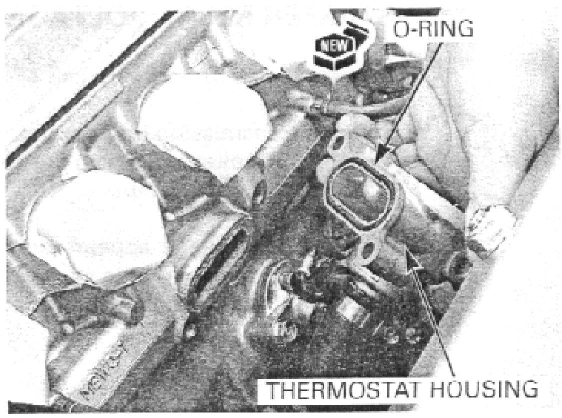
TORQUE: 12 N•m (1.2 kgf•m, 9 lbf•ft)

Install the rubber cap securely.



Install a new O-ring into the thermostat housing groove.

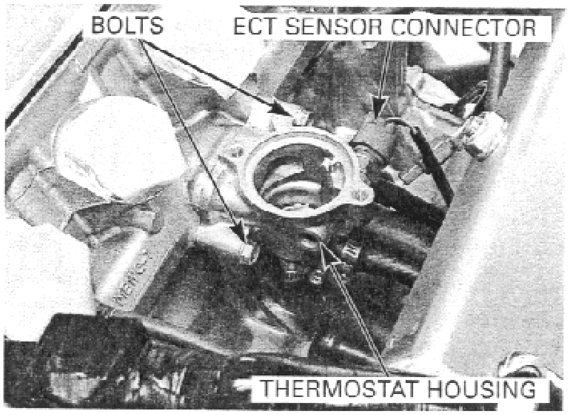
Install the thermostat housing to the cylinder head.



Install and tighten the mounting bolts.

Install the following:
- Thermostat housing/thermostat (page 6-6).
- Throttle body (page 5-62).

Fill the system with the recommended coolant (page 6-4).



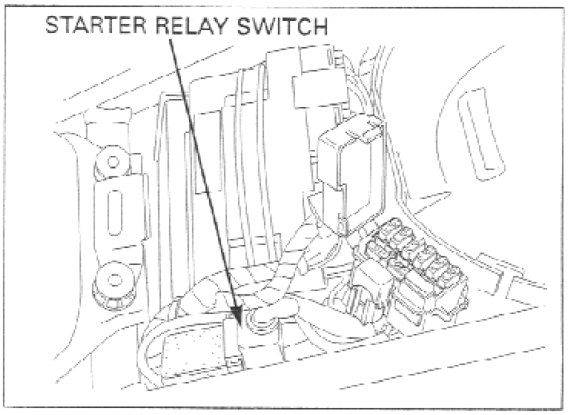
STARTER RELAY SWITCH

OPERATION INSPECTION

Remove the seat (page 2-2).

Shift the transmission into neutral.
Turn the ignition switch to "ON" and engine stop switch on.
Push the starter switch button.
The coil is normal if the starter relay switch clicks.

If you do not hear the switch click, inspect the relay switch using the procedure below.

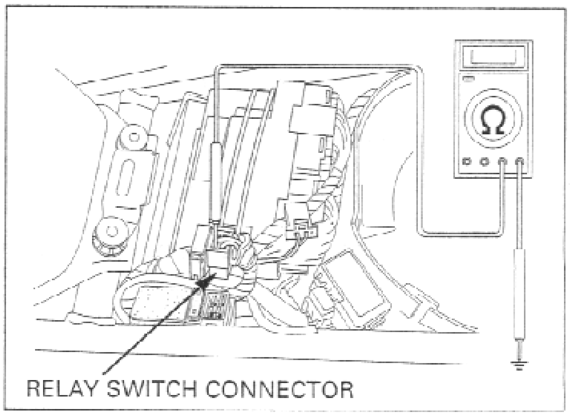


GROUND LINE INSPECTION

Disconnect the starter relay switch 4P connector.

Check for continuity between the Green/Red wire (ground line) and ground.

If there is continuity when the transmission is in neutral or when the clutch is disengaged and the side stand switch is retracted, the ground circuit is normal (in neutral, there is a slight resistance due to the diode).

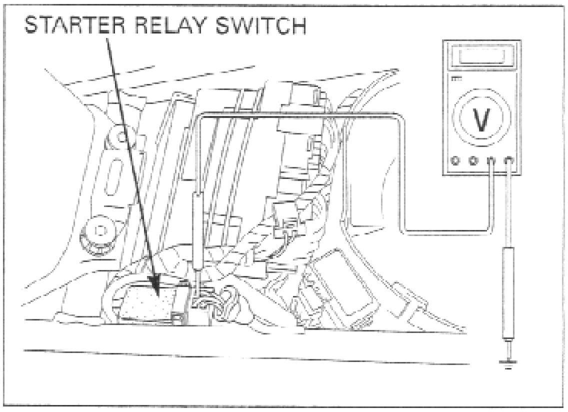


STARTER RELAY VOLTAGE INSPECTION

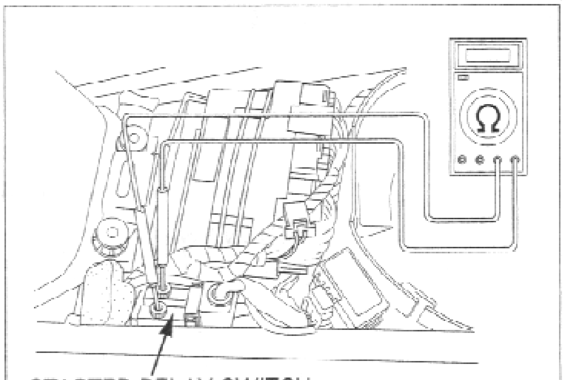
Connect the starter relay switch 4P connector.

Shift the transmission into neutral.
Measure the voltage between the Yellow/Red wire terminal (+) and ground (–).

If the battery voltage appears only when the starter switch is pushed with the ignition switch turned to "ON" and the engine stop switch on, it is normal.



CONTINUITY INSPECTION



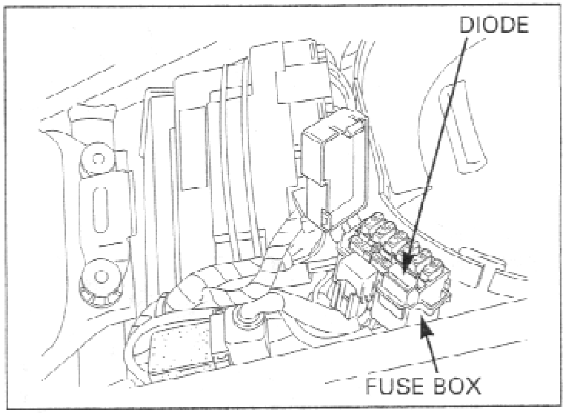
Disconnect the starter relay connector and cables.

Connect an ohmmeter to the large starter relay switch terminals.
Connect a fully charged 12-V battery to the starter relay switch connector terminals (Yellow/Red and Green/Red).
Check for continuity between the starter relay switch terminals.

There should be continuity while 12-V battery is connected to the starter relay switch connector terminals and should be no continuity when the battery is disconnected.

DIODE

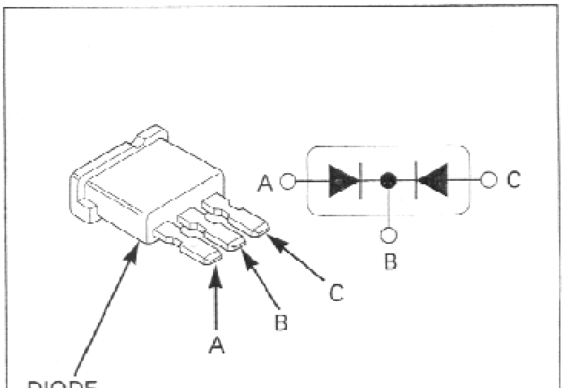
REMOVAL



Remove the seat (page 2-2).

Open the fuse box and remove the diode.

INSPECTION



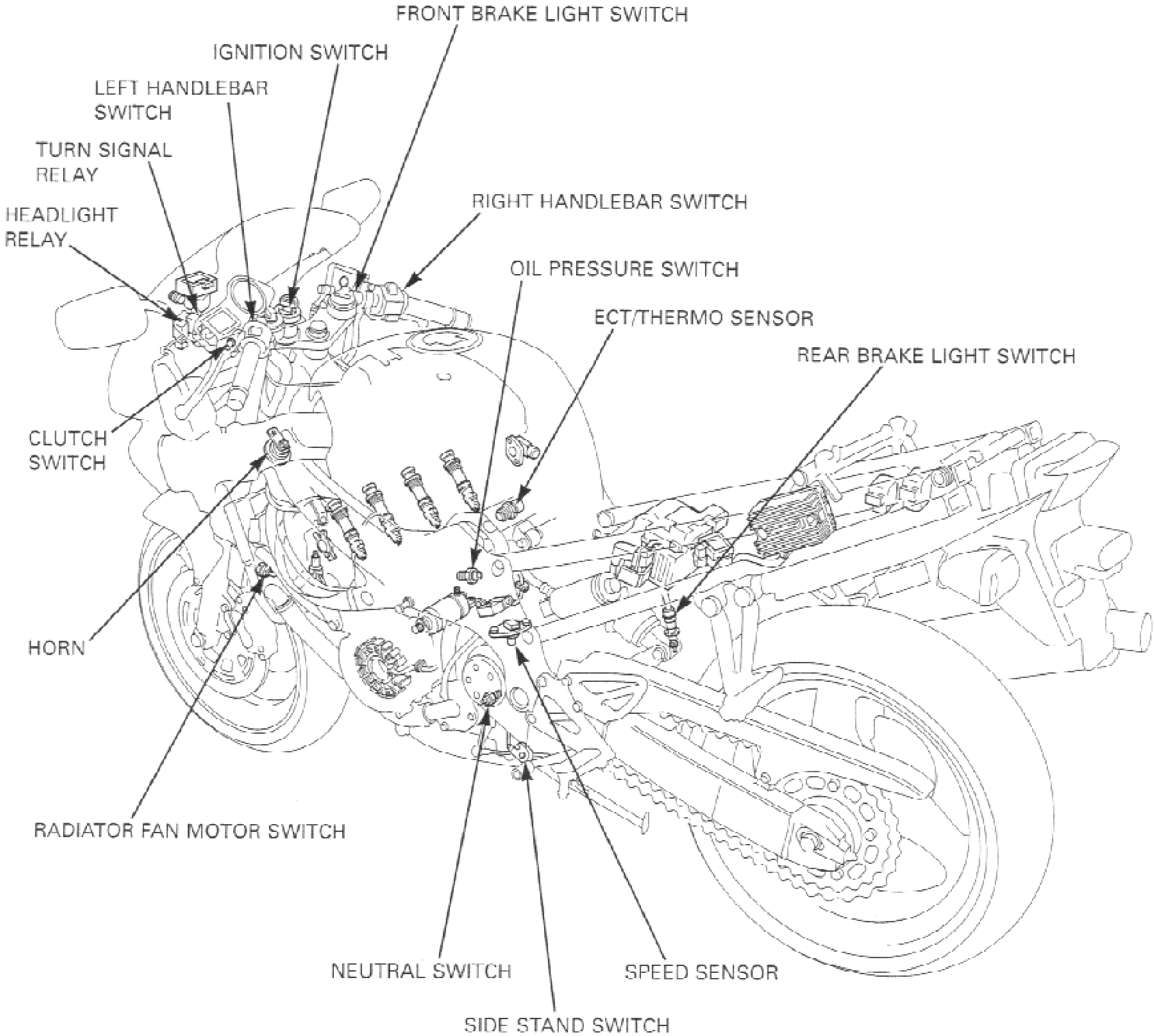
Check for continuity between the diode terminals. When there is continuity, a small resistance value will register.

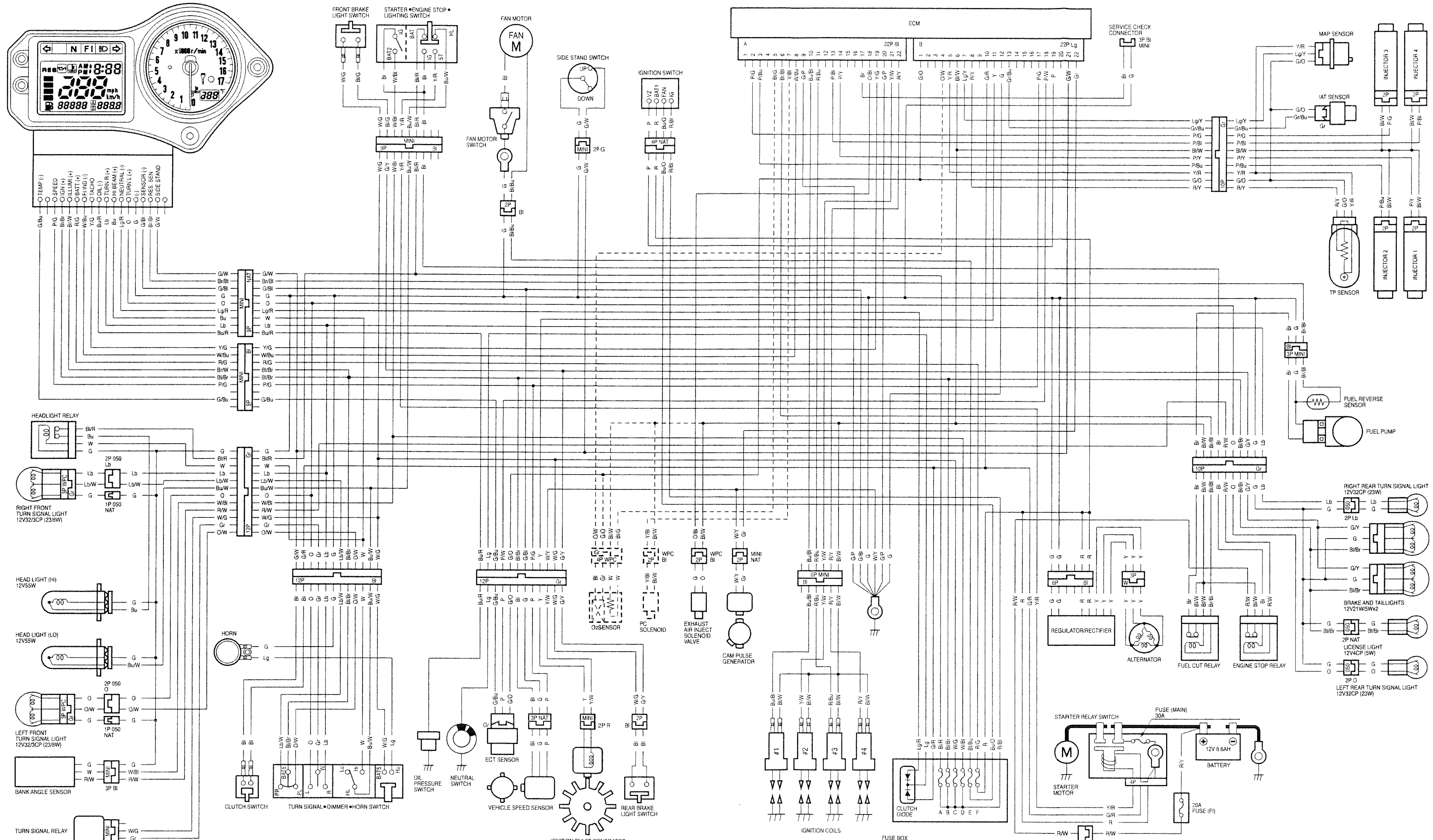
If there is continuity, in one direction, the diode is normal.

INSTALLATION

Install the diode in the reverse order of removal.

SYSTEM LOCATION





FUSE BOX

A 10A (HEADLIGHT)

B 10A (NEUTRAL•OIL•TEMPMETER•TACHOMETER•SPEEDOMETER•POSITION•HORN METER LIGHT•TAIL)

C 10A (TURN SIGNAL•ENGINE STOP•HORN•PASSING)

D 10A (STARTER•BANK ANGLE SENSOR)

E 10A (FAN MOTOR)

F 10A (METER)

TURN SIGNAL SWITCH

	W	R	L	BAT5	PR	PL
R	○	○		○		○
N				○	○	○
L	○		○	○	○	
COLOR	Gr	Lb	O	Br/W	Lb/W	O/W

DIMMER SWITCH

	HL	Lo	Hi
Lo			
(N)	○		○
Hi	○		○
COLOR			W

HORN SWITCH

	Ho	BAT5
FREE		
PUSH	○	○
COLOR	Lg	Bl/Br

ENGINE STOP SWITCH

	IG	BAT
OFF		
RUN	○	○
COLOR	Bl	W/Bl

STARTER SWITCH

	ST	IG	BAT3	HL
FREE			○	○
PUSH	○	○		
COLOR	Y/R	Bl	Bl/R	Bu/W

IGNITION SWITCH

	FAN	IG	BAT1	KEY
ON	○	○	○	KEY ON
OFF				KEY OFF
LOCK				KEY OFF LOCK PIN

Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

0030Z-MBW-A100
0030Z-MBW-L100

20

SERVICE INFORMATION

GENERAL

NOTICE

A halogen headlight bulb becomes very hot while the headlight is on, and remains hot for a while after it is turned off. Be sure to let it cool down before servicing.

- Use an electric heating element to heat the coolant for the fan motor switch inspection. Keep flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.
- Note the following when replacing the halogen headlight bulb.
  - Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
  - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
  - Be sure to install the dust cover after replacing the bulb.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- The following color codes are used throughout this section.

Bu = Blue	G = Green	Lg = Light Green	R = Red
Bl = Black	Gr = Gray	O = Orange	W = White
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow

SPECIFICATIONS

ITEM			SPECIFICATIONS
Bulbs	Headlight	Hi	12V – 55 W
		Lo	12V – 55 W
	Brake/tail light		12V – 21/5 W x 2
	Front turn signal/running light		12V – 32/3 CP (23/8 W) x 2
	Rear turn signal light		12V – 32 CP (23 W) x 2
	License light		12V – 4 CP (5 W)
	Instrument light		LED
	Turn signal indicator		LED
	High beam indicator		LED
	Neutral indicator		LED
	Oil pressure indicator		LED
	PGM-FI warning indicator		LED
	Low fuel indicator		LED
Fuse	Main fuse		30 A
	PGM-FI fuse		20 A
	Sub fuse		10 A x 6
Tachometer peak voltage			10.5 V minimum
Fan motor switch	Start to close (ON)		98 – 102 °C (208 – 216 °F)
	Stop to open		93 – 97 °C (199 – 207 °F)

TORQUE VALUES

Coolant temperature/ECT sensor	23 N•m (2.3 kgf•m, 17 lbf•ft)	
Side stand switch bolt	10 N•m (1.0 kgf•m, 7 lbf•ft)	ALOC bolt; replace with a new one.
Ignition switch mounting bolt	25 N•m (2.5 kgf•m, 18 lbf•ft)	
Fan motor switch	18 N•m (1.8 kgf•m, 13 lbf•ft)	Apply sealant to the threads.
Oil pressure switch	12 N•m (1.2 kgf•m, 9 lbf•ft)	Apply sealant to the threads.
Oil pressure switch wire terminal bolt/washer	2 N•m (0.2 kgf•m, 1.4 lbf•ft)	
Neutral switch	12 N•m (1.2 kgf•m, 9 lbf•ft)	

TROUBLESHOOTING

SPEED SENSOR/SPEEDOMETER

The odometer/trip meter operate normally, but the speedometer does not operate
- Faulty speedometer

The speedometer operate normally, but the odometer/trip meter does not operate
- Faulty odometer/trip meter

The speedometer operate is abnormal
- Check for the following before diagnosing.
  - Blown main or sub fuses
  - Loose or corroded terminals of the connectors
  - Discharged battery

Check for loose or poor contact of the speed sensor 3P (Natural) connector.
With the ignition switch turned to "ON" and measure the voltage at the speed sensor connector.

Abnormal →
- Loose or poor contact of related terminals.
- Open circuit in Black/Brown or Green/Black wires between the battery and speed sensor.

Normal ↓

Check for loose or poor contact of the combination meter multi-connectors.
With the ignition switch turned to "ON" and measure the voltage at the bottom of the speedometer terminals.

Abnormal →
- Loose or poor contact of related terminals.
- Open circuit in Black/Brown or Green/Black wires between the battery and speedometer.

Normal ↓

With the ignition switch turned to "OFF", check for continuity of the Pink/Green wire between the terminals of the speed sensor and speedometer.

Abnormal →
- Open circuit or loose connection in Pink/Green wire.

Normal ↓

Support the motorcycle using a hoist or other support to rise the rear wheel off the ground. Measure the output voltage (sensor signal) at the speedometer with the ignition switch is turned to "ON" while slowly turning the rear wheel by your hand.

Abnormal →
- Faulty speed sensor.
- Loose speed sensor mounting bolts.

Normal →
- Faulty speed sensor.

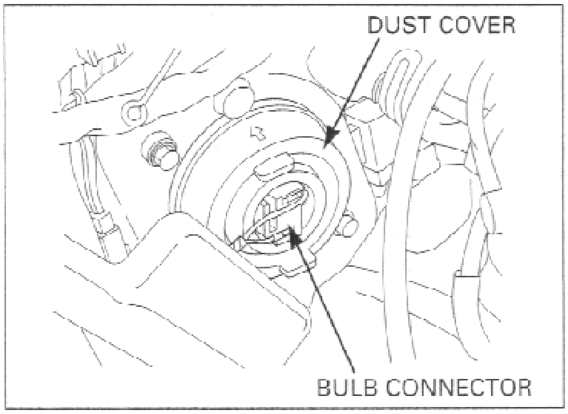
HEADLIGHT

BULB REPLACEMENT

Remove the air duct cover (page 2-9).

Release the resonator chamber from the hook arm.

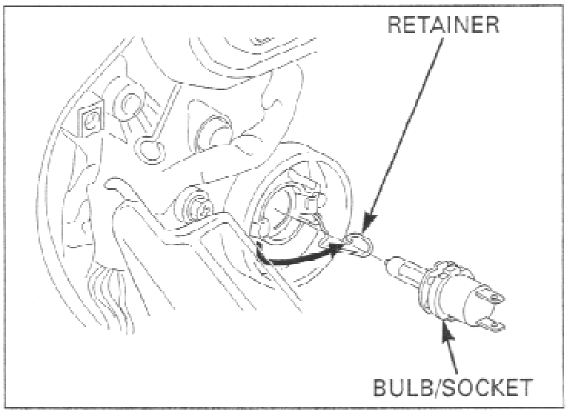
Disconnect the headlight bulb connectors.
Remove the dust cover.



Avoid touching the halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.

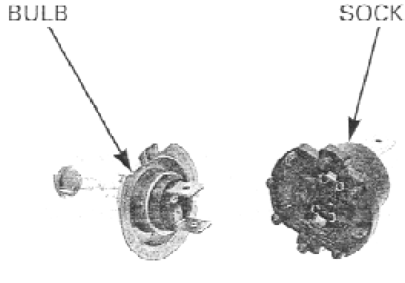
Unhook the bulb retainer and remove the headlight bulb/socket.

If you touch the bulb with your bare hands, clean it with cloth moistened with denatured alcohol to prevent early bulb failure.

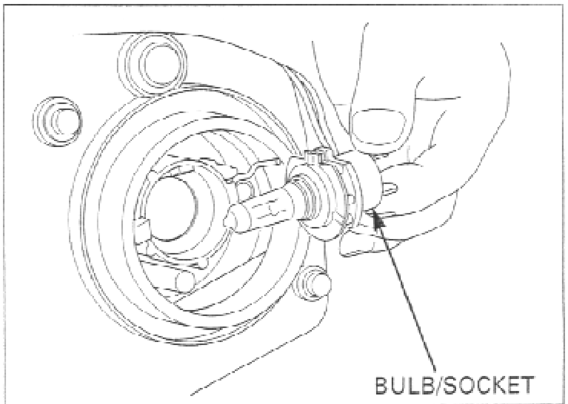


Remove the headlight bulb from the socket.

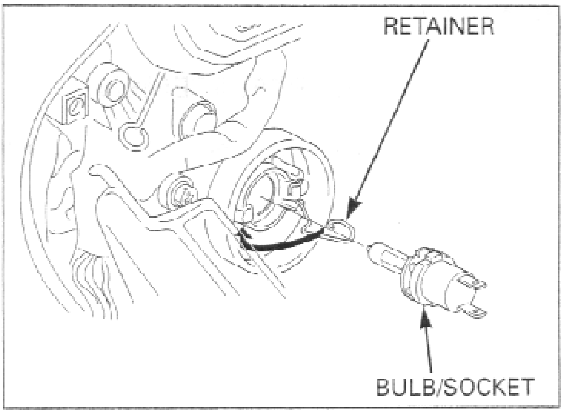
Install a new bulb into the socket.



Install the new headlight bulb/socket aligning its tabs with the groove in the headlight unit.

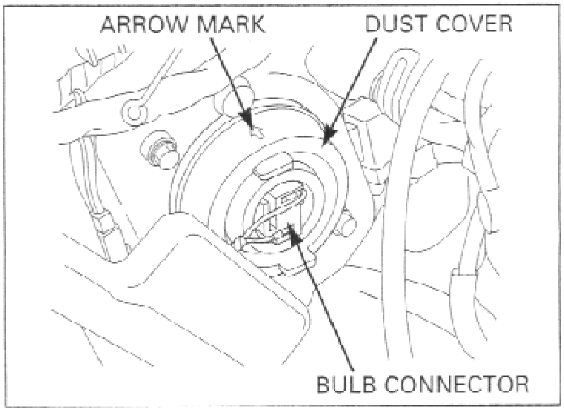


Hook the bulb retainer into the headlight unit groove.



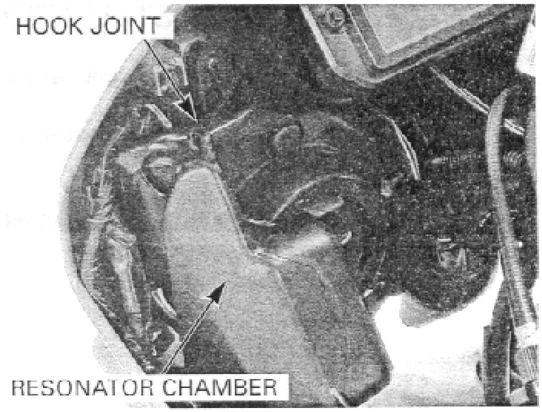
Install the dust cover tightly against the headlight unit with its arrow mark facing up.

Connect the headlight connectors.



Hook the resonator chamber to the hook joint.

Install the air duct cover (page 2-12).

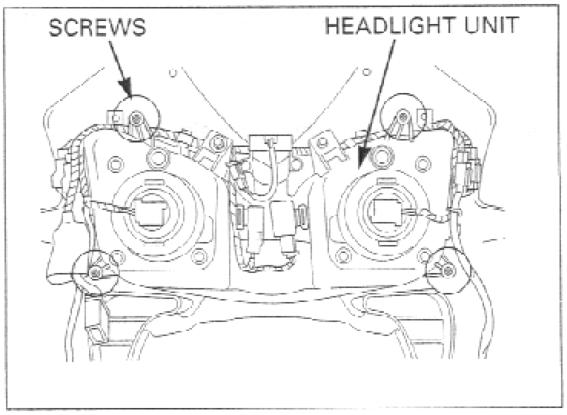


REMOVAL/INSTALLATION

Remove the upper cowl (page 2-7).

Disconnect the turn signal/running light connectors. Remove the four screws and headlight unit.

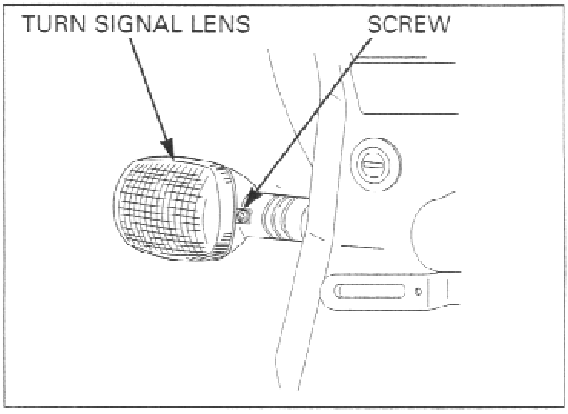
Install the headlight unit in the reverse order of removal.



TURN SIGNAL

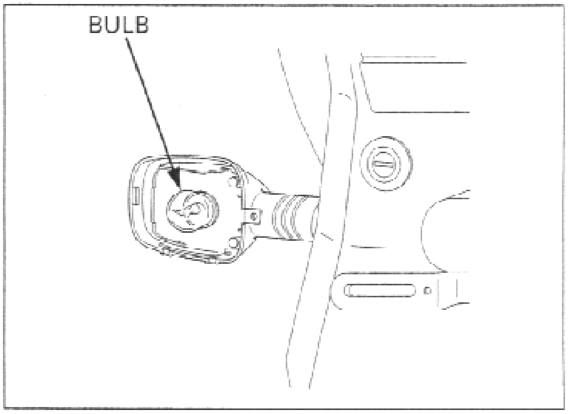
BULB REPLACEMENT

Remove the screw and turn signal lens.



While pushing in the bulb, turn it counterclockwise, remove it and replace with a new one.

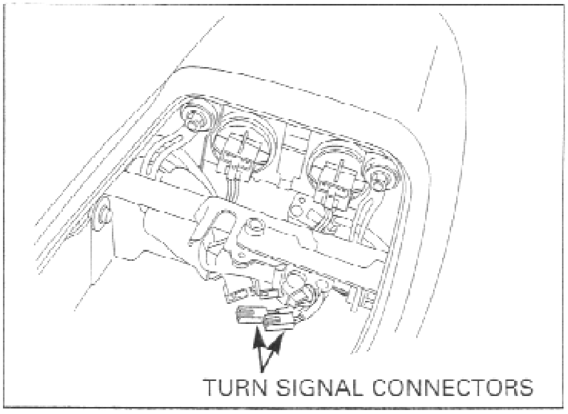
Install the turn signal lens in the reverse order of removal.



REMOVAL/INSTALLATION

For front turn signal unit removal, see upper cowl removal (page 2-9).
For rear turn signal removal, remove the seat/rear cowl (page 2-2)

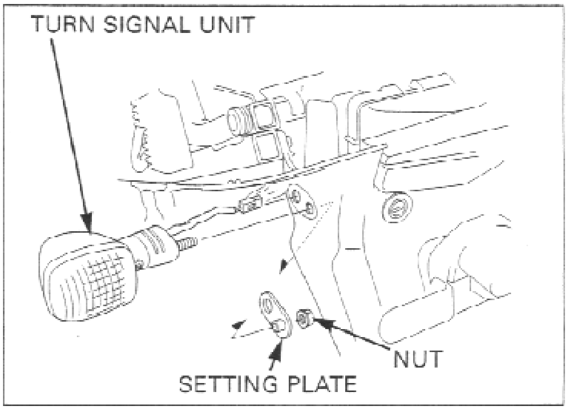
Disconnect the turn signal connector.



Remove the turn signal mounting nut.
Release the turn signal wire and remove the turn signal unit.

Route the turn signal wire properly (page 1-24).

Install the turn signal unit in the reverse order of removal.

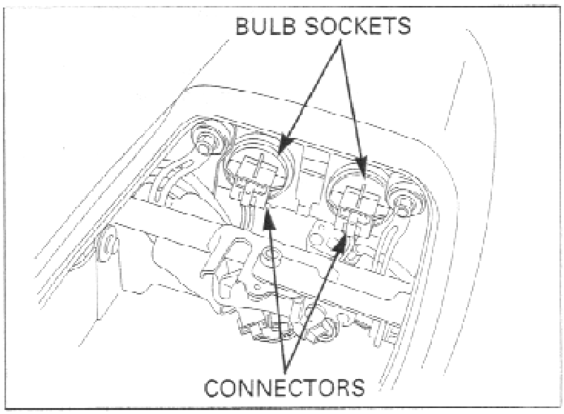


TAIL/BRAKE LIGHT

BULB REPLACEMENT

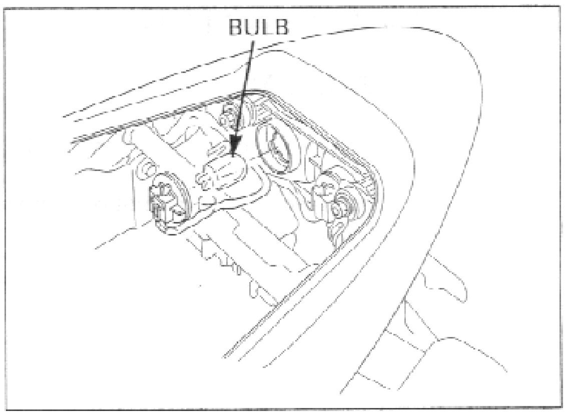
Remove the pillion seat (page 2-2).

Disconnect the tail/brake light connectors.
Turn the bulb socket counterclockwise, then remove the bulb socket.



While pushing in the bulb, turn them counterclockwise, remove them and replace with new ones.

Install the tail/brake light sockets in the reverse order of removal.

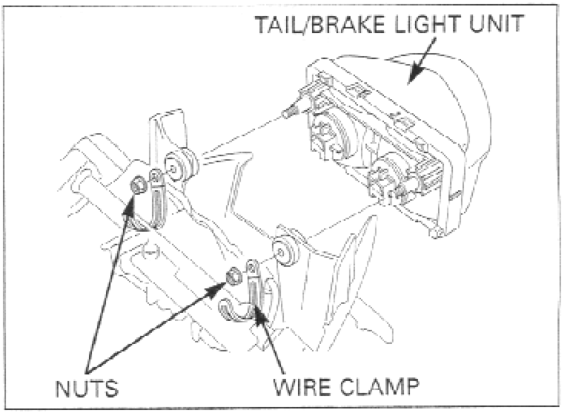


REMOVAL/INSTALLATION

Remove the rear cowl (page 2-9).

Remove the two nuts, wire clamps and tail/brake light unit.

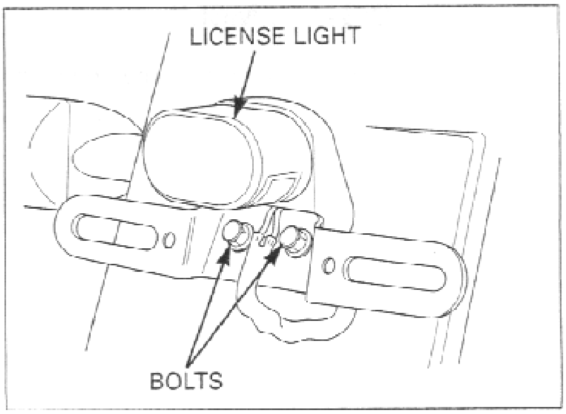
Installation is in the reverse order of removal.



LICENSE LIGHT

BULB REPLACEMENT

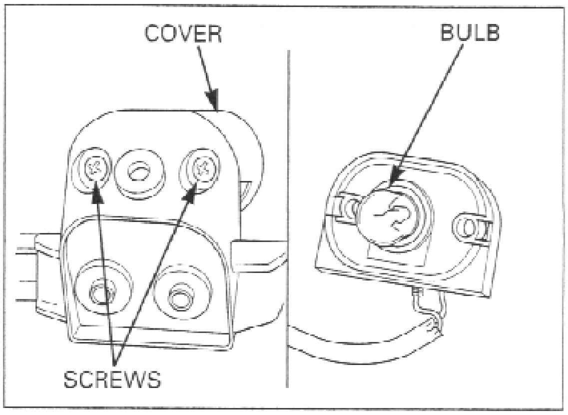
Remove the license light bracket bolts and the license light assembly.



Remove the screws, license light cover and lens.

While pushing in the bulb, turn it counterclockwise, remove it and replace with a new one.

Install the license light assembly in the reverse order of removal.

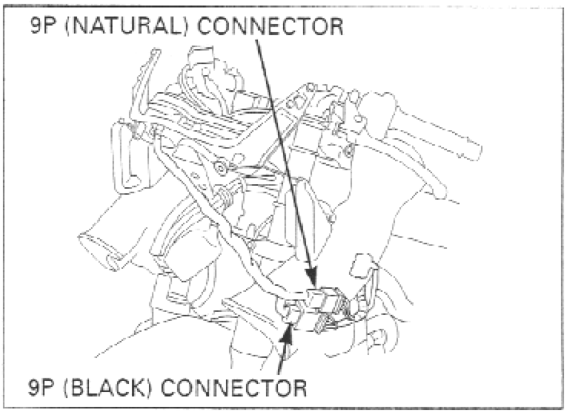


COMBINATION METER

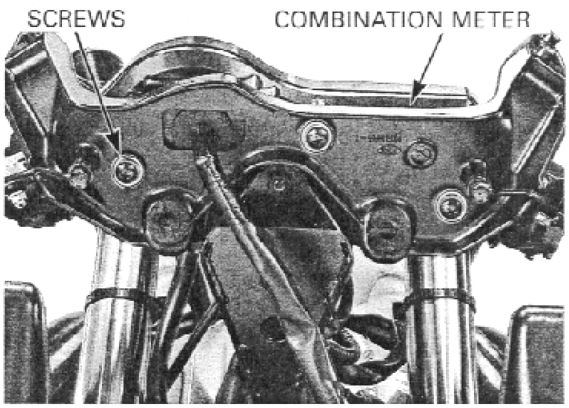
REMOVAL

Remove the upper cowl (page 2-7).

Disconnect the combination meter 9P (Natural) and 9P (Black) connectors.

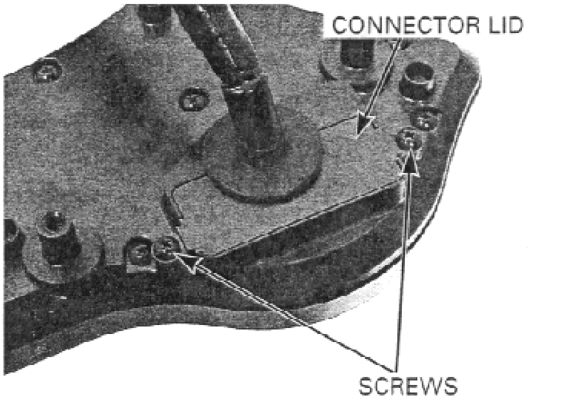


Remove the combination meter mounting screws and combination meter.

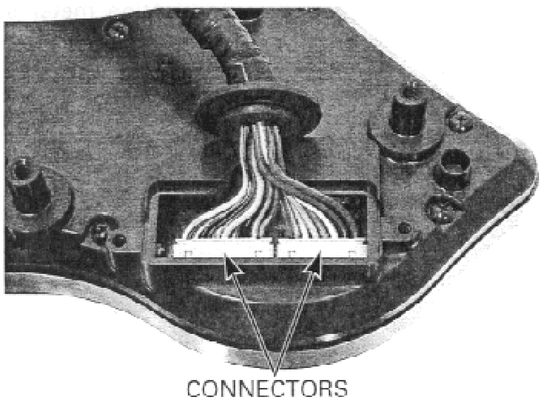


DISASSEMBLY

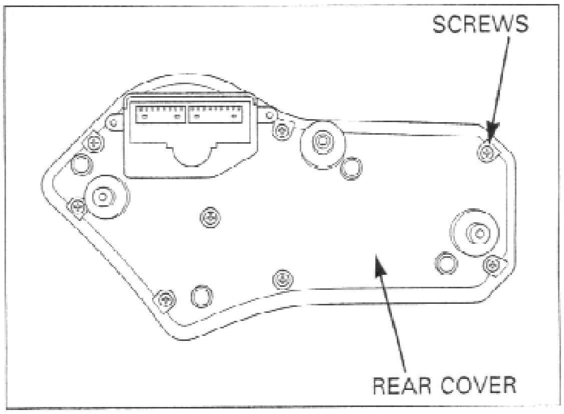
Remove the screws and combination meter harness connector lid.



Disconnect the combination meter sub-harness connectors.



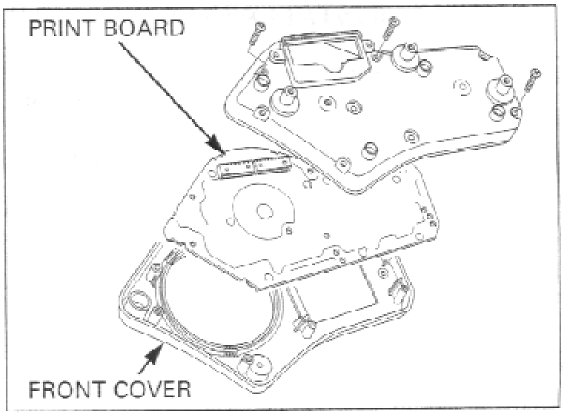
Remove the screws and combination meter rear cover.



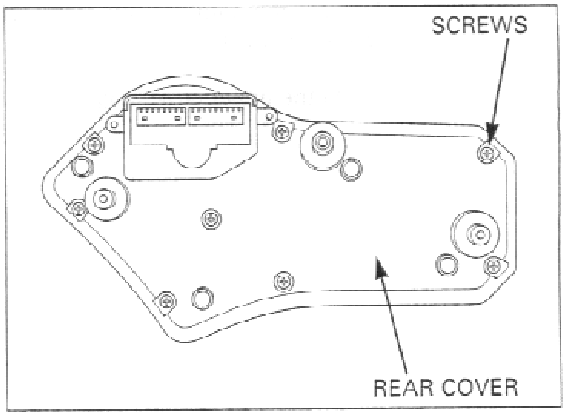
Remove the combination meter print board assembly from the front cover.

ASSEMBLY

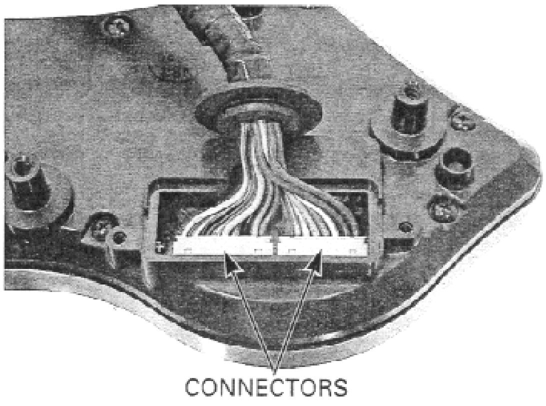
Install the print board assembly into the front cover.



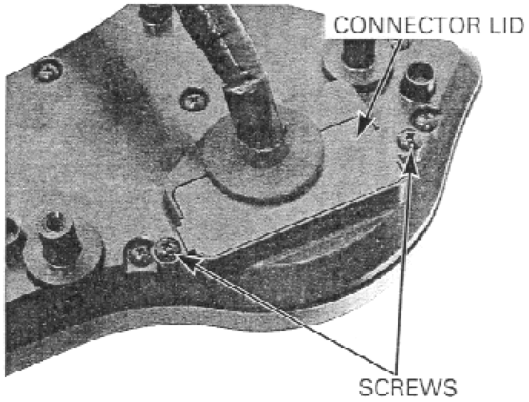
Install the rear cover and tighten the screws securely.



Connect the combination meter sub-harness to the print board.



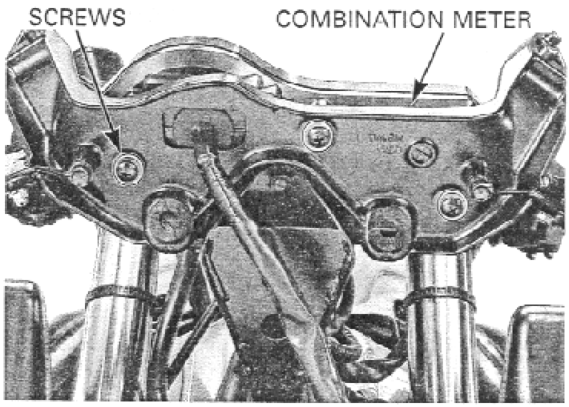
Install the harness connector lid while installing the grommet into the grooves of the rear cover and harness lid.



INSTALLATION

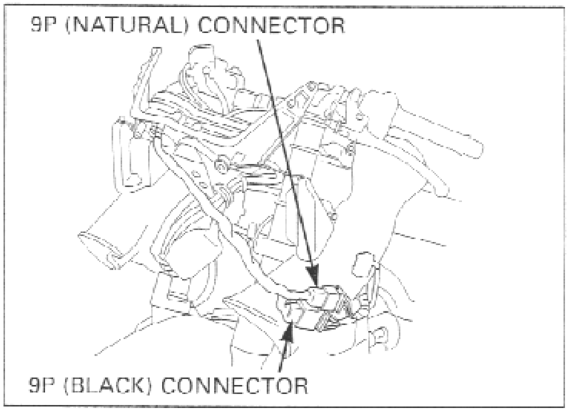
Install the combination meter onto the bracket aligning the bosses with the grommets on the bracket.

Install and tighten the mounting screws.

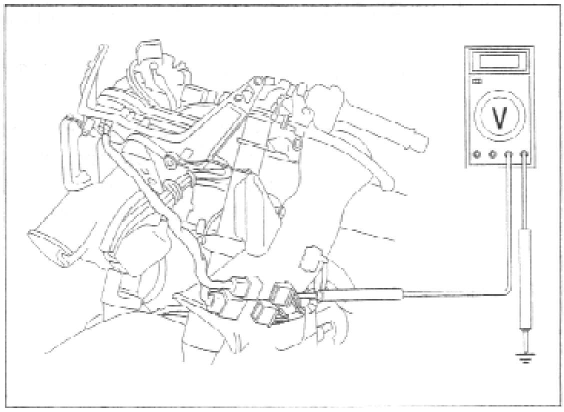


Connect the combination meter 9P (Natural) and 9P (Black) connectors.

Install the upper cowl (page 2-9).



POWER/GROUND LINE INSPECTION



Disconnect the combination meter multi-connector.
Check the following at the wire harness side connector terminals of the combination meter.

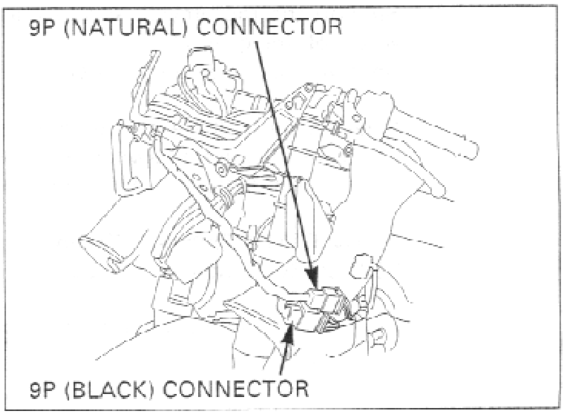
Power input line
Measure the voltage between the Black/Brown wire terminal (+) and Ground (–).
There should be battery voltage with the ignition switch turned to "ON".
If there is no voltage, check for an open circuit in Black/Brown wire.

Back-up voltage line
Measure the voltage between the Red/Green wire terminal (+) and Ground (–).
There should be battery voltage at all times.
If there is no voltage, check for an open circuit in Red/Green wire.

Sensor ground line
Check for continuity between the Green/Black wire terminal (+) and Ground (–).
There should be battery voltage at all times.
If there is no voltage, check for an open circuit in Green/Black wire.

SPEEDOMETER/VEHICLE SPEED SENSOR

SYSTEM INSPECTION



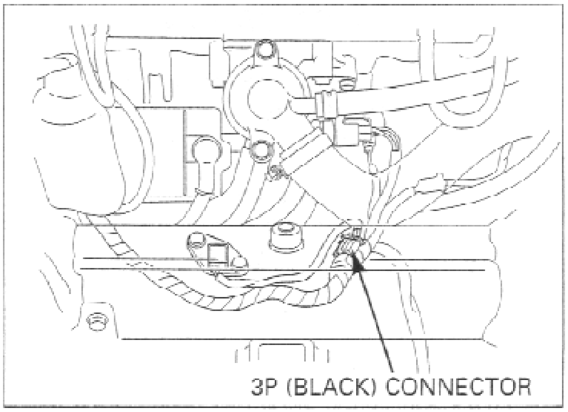
Check that the tachometer and coolant temperature meter function properly.
- If they do not function, perform the power and ground line inspection of the combination meter (see above).
- If they function, shift the transmission into neutral, disconnect the combination meter combination meter 9P (Natural) and 9P (Black) connectors and turn the ignition switch to "ON".
  Measure the voltage between the Pink/Green (+) and Green/Black (–) wire terminals of the wire harness side connector.
  Slowly turn the rear wheel by hand.
  There should be 0 to 5 V pulse voltage.

– If no pulse voltage appears, replace the combination meter print circuit board.
– If pulse voltage does not appear, check for an open or short circuit in Pink/Green wire.
  If the Pink/Green wire is OK, check for the speed sensor (page 19-12).

SPEED SENSOR INSPECTION

Remove the throttle body (page 5-62).

Disconnect the speed sensor 3P (Black) connector and check for loose or poor contact of the connector.
Also check for loose or poor contact of the engine sub-harness 12P (Gray) connector.

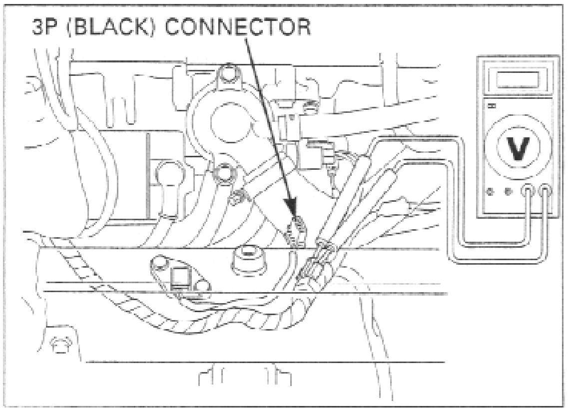


Connect the engine sub-harness 12P (Gray) connector and speed sensor 3P (Black) connector.

Turn the ignition switch is to "ON" and measure the voltage at the 3P (Black) connector with the connector connected.

Connection: Black (+) – Green (–)
Standard: Battery voltage

If there is no voltage, check for an open circuit in the Black and Green wires and loose contact of the wire harness connectors.

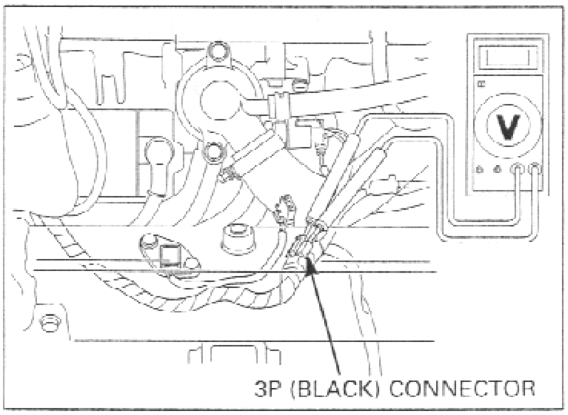


Support the motorcycle securely and place the rear wheel off the ground.
Shift the transmission into neutral.

Measure the voltage at the sensor connector terminals with the ignition switch is turned to "ON" while slowly turning the rear wheel by hand.

CONNECTION: Pink (+) – Green (–)
STANDARD: Repeat 0 to 5V

If the measurement is out of specification, replace the speed sensor.

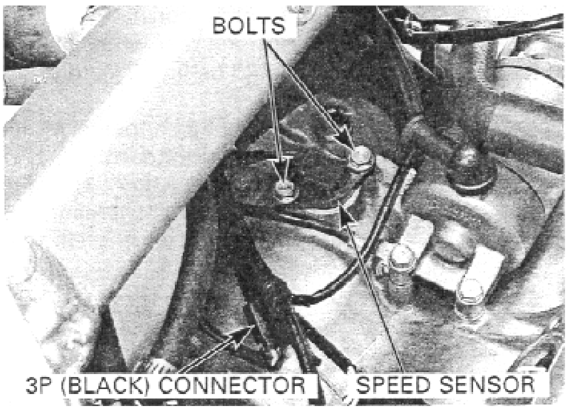


REMOVAL/INSTALLATION

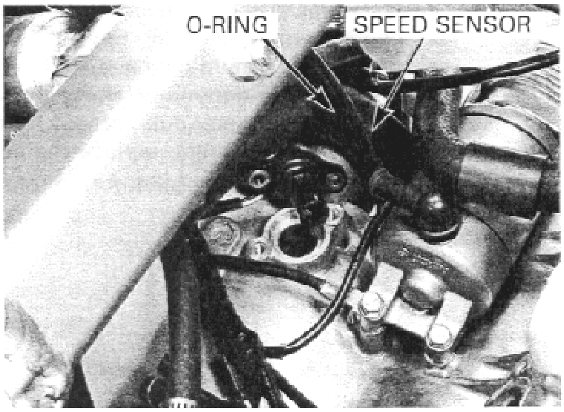
Remove the throttle body (page 5-62).

Disconnect the speed sensor 3P (Black) connector from the engine sub-harness.

Remove the bolts and speed sensor.



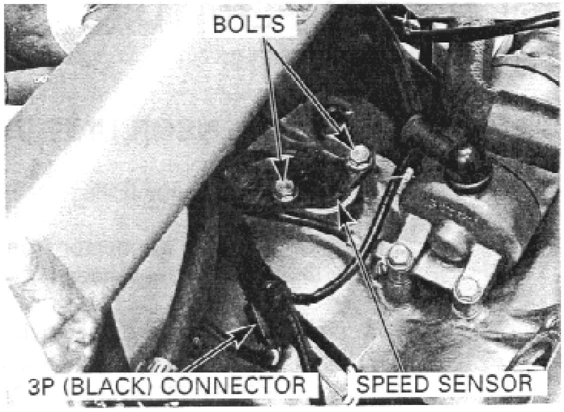
Check that the O-ring is in good condition, replace if necessary.
Install the speed sensor into the upper crankcase.



Install and tighten the mounting bolts securely.

Route the sensor wire.

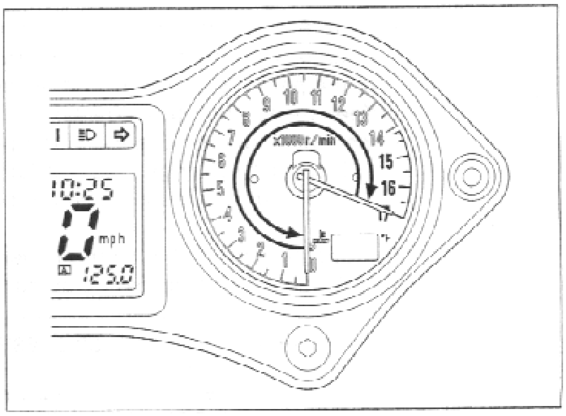
Connect the speed sensor 3P (Black) connector.



TACHOMETER

SYSTEM INSPECTION

Turn the ignition switch to "ON" and check that the tachometer needle move to full scale and then returns to zero.



If the needle does not show initial function, check for combination meter power input line (page 19-11).

Disconnect the combination meter 9P (Natural) and 9P (Black) connectors (page 19-11).
Connect the peak voltage adaptor to the tachometer Yellow/Green (+) terminal and Green (–).

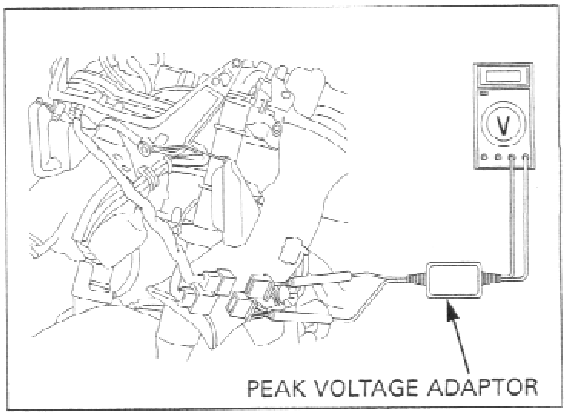
TOOLS:
Peak voltage tester (U.S.A. only) or
Peak voltage adaptor 07HGJ–0020100
(not available in U.S.A.)
with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)

CONNECTION: Yellow/Green (+) and Green (-)

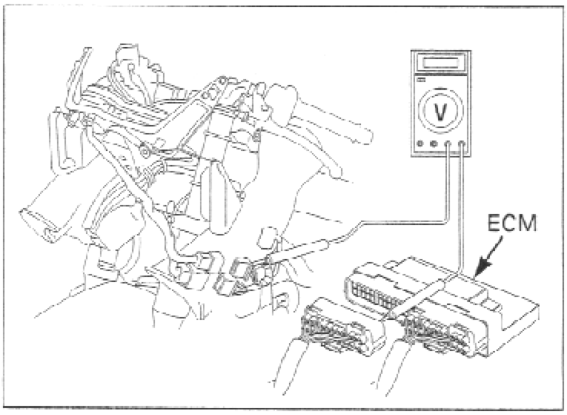
Start the engine and measure the tachometer input peak voltage.

PEAK VOLTAGE: 10.5 V minimum

If the value is normal, replace the tachometer.
If the measured value is below 10.5 V, replace the ECM.



If the value is 0 V, check for continuity between the combination meter 9P (Black) connectors terminal and the ECM multi-connector Yellow/Green terminals. If there is no continuity, check the wire harness and combination meter sub-harness for an open circuit. If there is continuity, replace the combination meter printed circuit board (page 19-8).

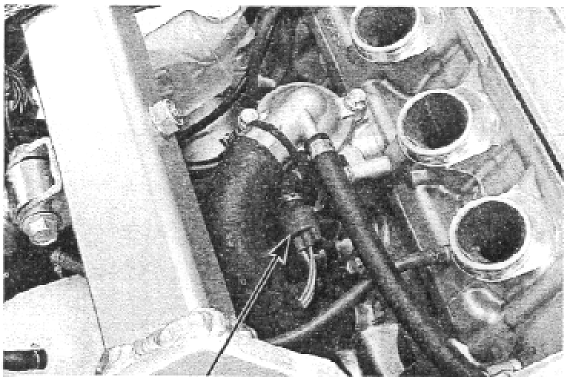


COOLANT TEMPERATURE GAUGE/SENSOR

THERMO SENSOR UNIT INSPECTION

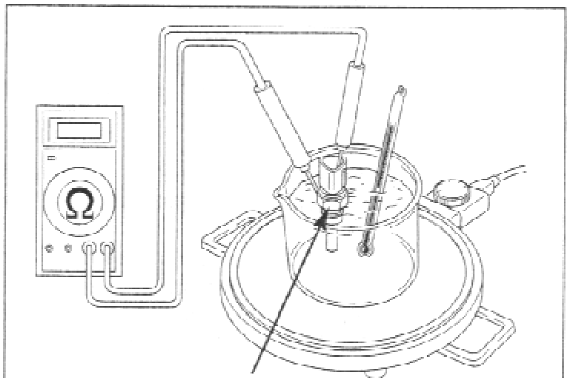
Drain the coolant (page 6-3).

Disconnect the wire connector from the ECT/thermo sensor and remove the sensor.


ECT/THERMO SENSOR CONNECTOR

Suspend the ECT/thermo sensor in a pan of coolant (1:1 mixture) on an electric heating element and measure the resistance through the sensor as the coolant heats up.

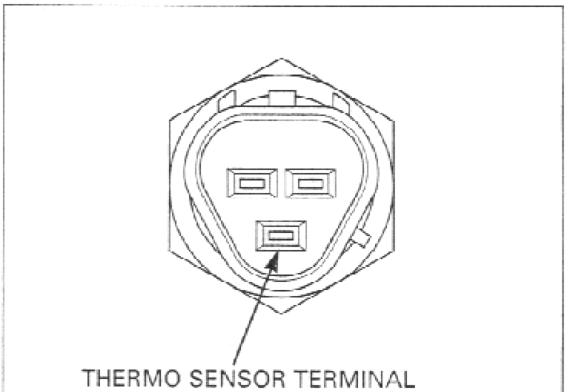
- Soak the ECT/thermo sensor in coolant up to its threads with at least 40 mm (1.6 in) from the bottom of the pan to the bottom of the sensor.
- Keep the temperature constant for 3 minutes before testing. A sudden change of temperature will result in incorrect readings. Do not let the thermometer or ECT/thermo sensor touch the pan.



ECT/THERMO SENSOR

Replace the sensor if it is out of specification by more than 10% at any temperature listed.

Temperature	80°C (68°F)	120°C (248°F)
Resistance	2.1 – 2.6 kΩ	0.65 – 0.73 kΩ


THERMO SENSOR TERMINAL

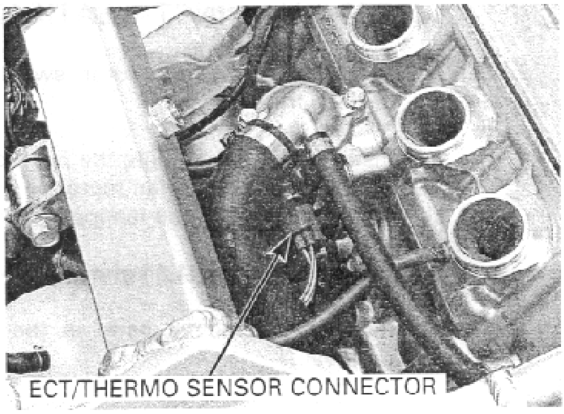
Always replace the sealing washer with a new one.

Install and tighten the ECT/thermo sensor to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

Connect the ECT/thermo sensor connector.

Fill the system and bleed the air (page 6-4).

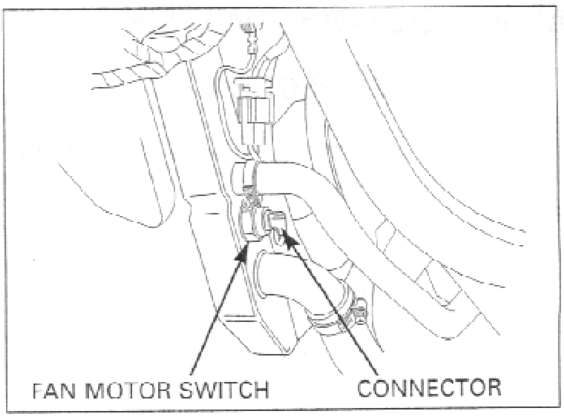


COOLING FAN MOTOR SWITCH

INSPECTION

Remove the following:
- Seat (page 2-2)
- Lower cowl (page 2-4)

Check for a blown fuse before inspection.



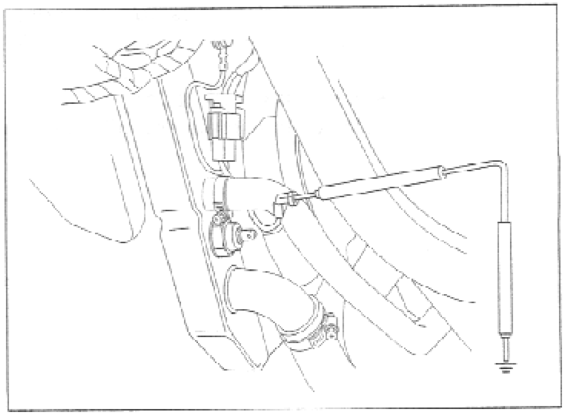
Fan motor does not stop
Turn the ignition switch to "OFF", disconnect the connector from the fan motor switch and turn the ignition switch to "ON" again.

If the fan motor does not stop, check for a shorted wire between the fan motor and switch.
If the fan motor stops, replace the fan motor switch.

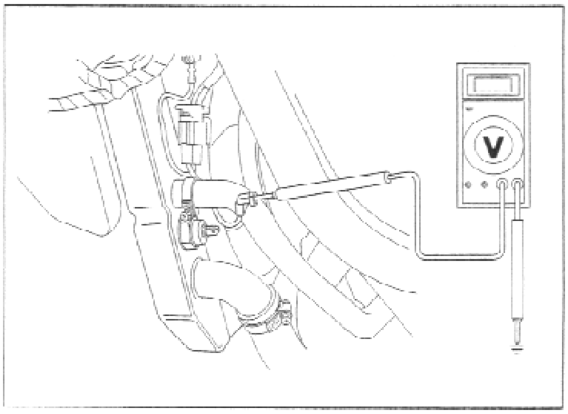
Fan motor does not start
Before testing, warm up the engine to operating temperature.

Disconnect the connector from the fan motor switch and ground the connector to the body with a jumper wire.
Turn the ignition switch to "ON" and check the fan motor.

If the motor starts, check the connection at the fan motor switch terminal.
If it is OK, replace the fan motor switch.



If the motor does not start, check for voltage between the fan motor switch connector and ground.
If battery voltage is measured, replace the fan motor.
If there is no battery voltage, check for poor connection of the connector or a damaged wire harness.



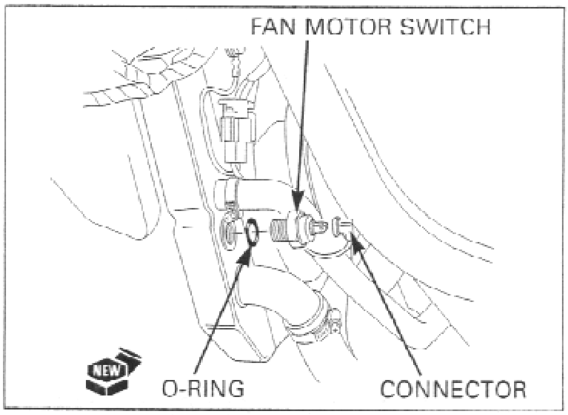
REMOVAL/INSTALLATION

Disconnect the fan motor switch connector and remove the switch.

Install a new O-ring onto the fan motor switch.
Apply sealant to the fan motor switch threads.
Install and tighten the fan motor switch.

TORQUE: 18 N•m (1.8 kgf•m, 13 lbf•ft)

Install the removed parts in the reverse order of removal.

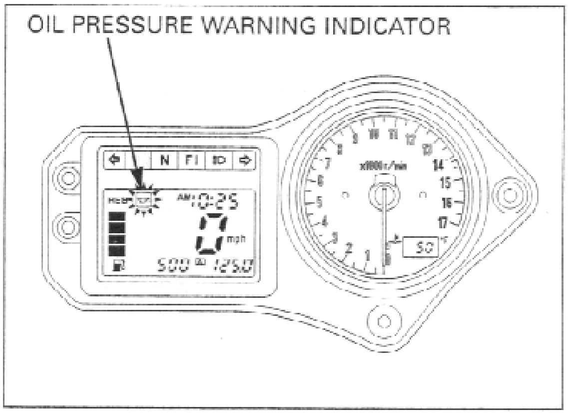


OIL PRESSURE SWITCH

INSPECTION

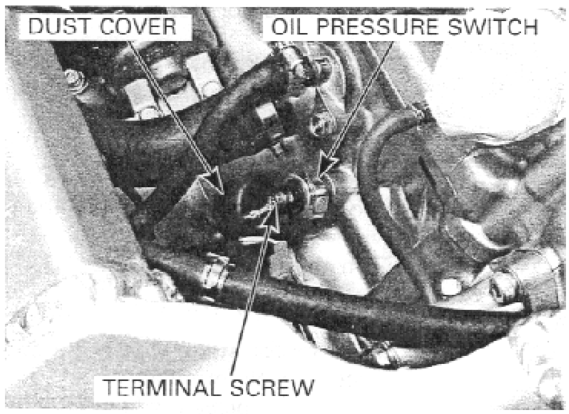
If the oil pressure warning indicator stays on while the engine is running, check the engine oil level before inspection.

Make sure the oil pressure warning indicator come on with the ignition switch turned to "ON".



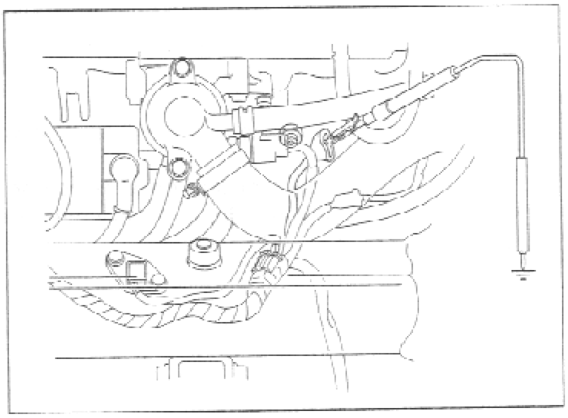
If the indicator does not come on, inspect as follow:
Remove the throttle body (page 5-62).

Remove the dust cover.
Remove the screw and oil pressure switch terminal.



Short the oil pressure switch wire terminal with the ground using a jumper wire.
The oil pressure warning indicator comes on with the ignition switch turned to "ON".
If the light does not come on, check the sub-fuse (10A) and wires for a loose connection or an open circuit.

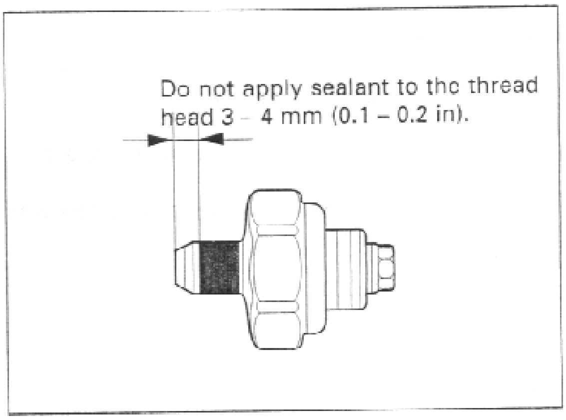
Start the engine and make sure the light goes out.
If the light does not go out, check the oil pressure (page 4-3).
If the oil pressure is normal, replace the oil pressure switch (see below).



REMOVAL/INSTALLATION

Remove the boot, terminal screw and wire terminal (see previous page).
Remove the oil pressure switch from the crankcase.

Apply sealant to the oil pressure switch threads as shown.



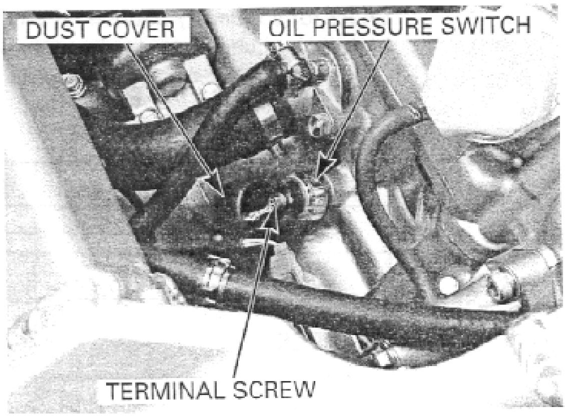
Install the oil pressure switch onto the crankcase, tighten it to the specified torque.

TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)

Connect the oil pressure switch terminal to the switch and tighten the screw to the specified torque.

TORQUE: 2 N·m (0.2 kgf·m, 1.4 lbf·ft)

Install the dust cover.



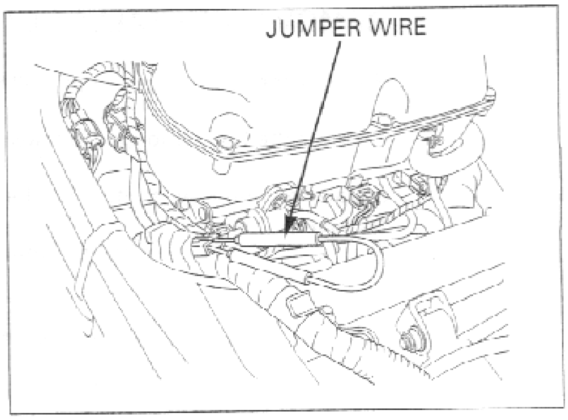
FUEL RESERVE SENSOR

INSPECTION

Turn the ignition switch to "ON" and make sure the fuel reserve indicator comes on.

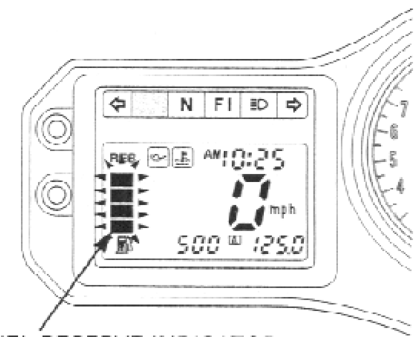
If the fuel reserve indicator does not indicate properly, check for the following.

Disconnect the fuel reserve sensor 3P (Black) connector.
Short the wire harness side connector Brown/Black and Green/Black terminals with a jumper wire.



Turn the ignition switch to "ON" and make sure the fuel reserve indicator comes on with the side stand retracted.

If the indicator comes on, replace the fuel pump assembly.
If the indicator still does not come on, check for an open or short circuit in wire harness.

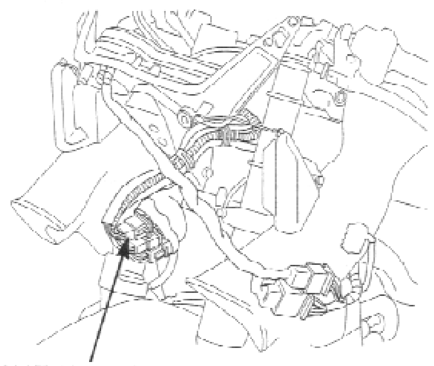


IGNITION SWITCH

INSPECTION

Remove the upper cowl (page 2-7).

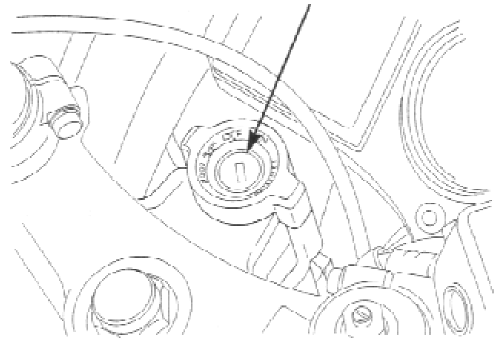
Disconnect the ignition switch wire 4P (Natural) connectors.



Check for continuity between the wire terminals of the ignition switch connector in each switch position.
Continuity should exist between the color coded wires as follows:

IGNITION SWITCH

	FAN	IG	BAT1	KEY
ON	O	O	O	KEY ON
OFF				KEY OFF
LOCK				KEY OFF LOCK PIN
COLOR	Bu/O	R/Bl	R	——



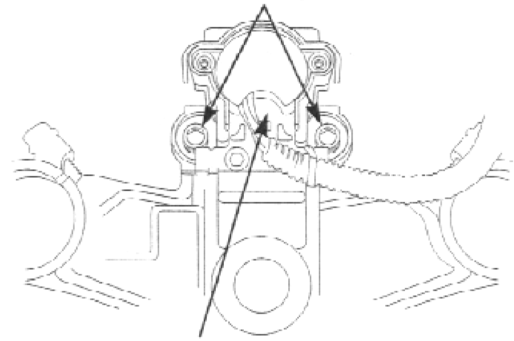
REMOVAL/INSTALLATION

Remove the top bridge (page 13-24).

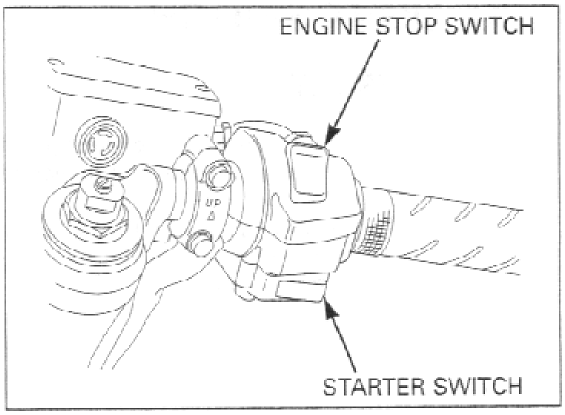
Remove the bolts and ignition switch.

Install the ignition switch in the reverse order of removal.
Tighten the ignition switch mounting bolt to the specified torque.

TORQUE: 25 N•m (2.5 kgf•m, 18 lbf• ft)



HANDLEBAR SWITCHES



Disconnect the handlebar switch connectors.

Check for continuity between the wire terminals of the handlebar switch connector.
Continuity should exist between the color coded wire terminals as follows:

STARTER SWITCH

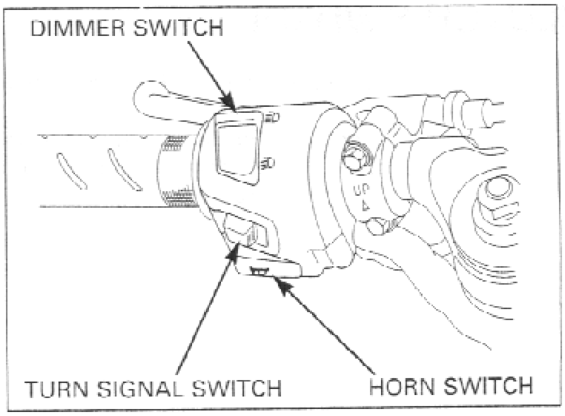
	ST	IG	BAT3	HL
FREE			O	O
PUSH	O	O		
COLOR	Y/R	Bl	Bl/R	Bu/W

TURN SIGNAL SWITCH

	W	R	L	BAT5	PR	PL
R	O	O		O		O
N				O	O	O
L	O		O	O	O	
COLOR	GR	SB	O	Br/W	SB/W	O/W

DIMMER SWITCH

	HL	Lo	Hi
Lo			
(N)	O		O
Hi	O		O
COLOR	Bu/W		W



ENGINE STOP SWITCH

	IG	BAT
OFF		
RUN	O	O
COLOR	Bl	W/Bl

HORN SWITCH

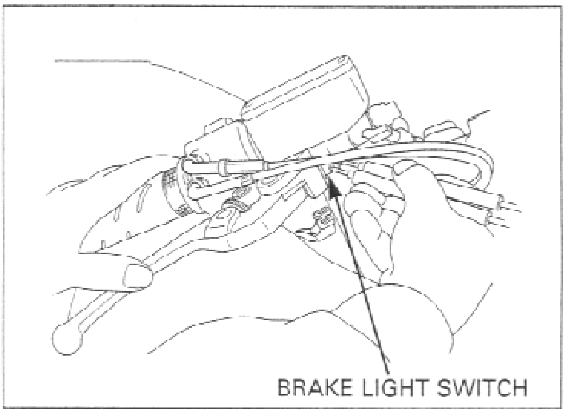
	Ho	BAT5
FREE		
PUSH	O	O
COLOR	Lg	Bl/Br

BRAKE LIGHT SWITCH

FRONT

Disconnect the front brake light switch connectors and check for continuity between the terminals.

There should be continuity with the brake lever applied, and there should be no continuity with the brake lever released.

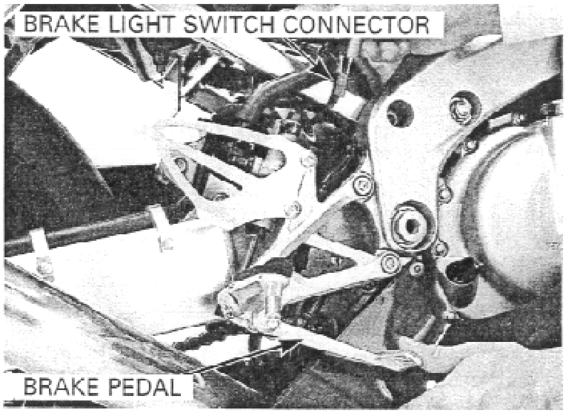


REAR

Remove the seat (page 2-2).

Disconnect the rear brake light switch connector and check for continuity between the terminals.

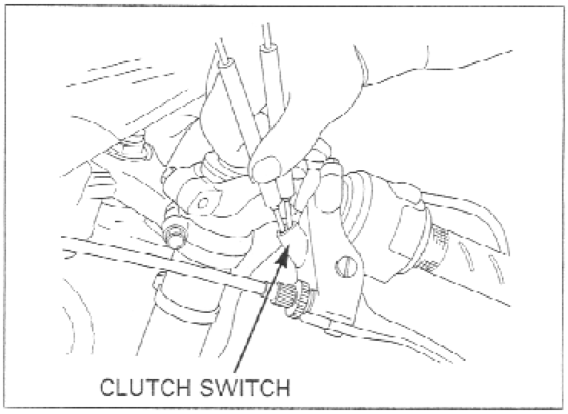
There should be continuity with the brake pedal applied, and there should be no continuity with the brake pedal released.



CLUTCH SWITCH

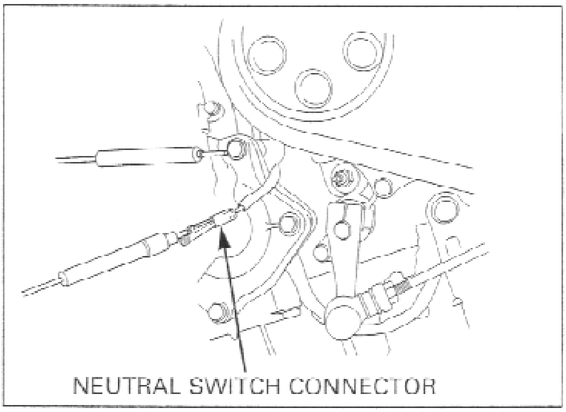
Disconnect the clutch switch connectors.

There should be continuity with the clutch lever applied, and there should be no continuity with the clutch lever released.



NEUTRAL SWITCH

Disconnect the neutral switch connector from the switch.
Shift the transmission into neutral and check for continuity between the Light green wire terminal and ground.
There should be continuity with the transmission in neutral, and no continuity when the transmission is in gear.

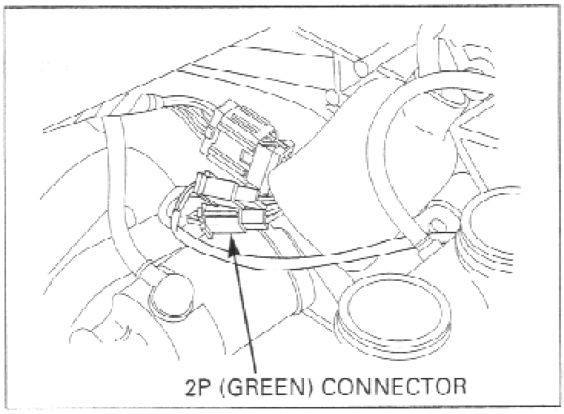


SIDE STAND SWITCH

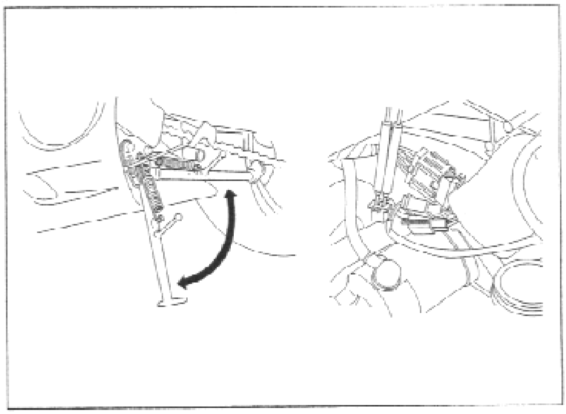
INSPECTION

Support the front end of fuel tank (page 3-4).

Disconnect the side stand switch 2P (Green) connector.



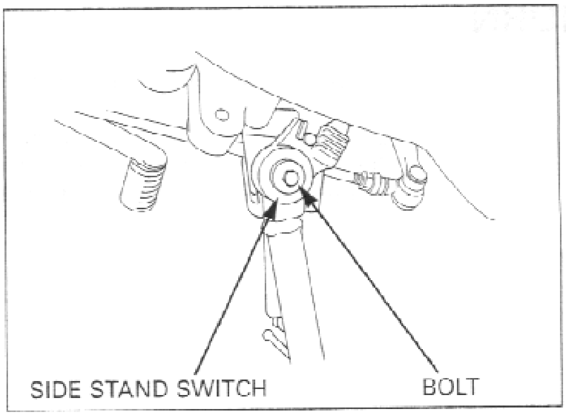
Check for continuity between the wire terminals of the side stand switch connector.
Continuity should exist only when the side stand is up.



REMOVAL

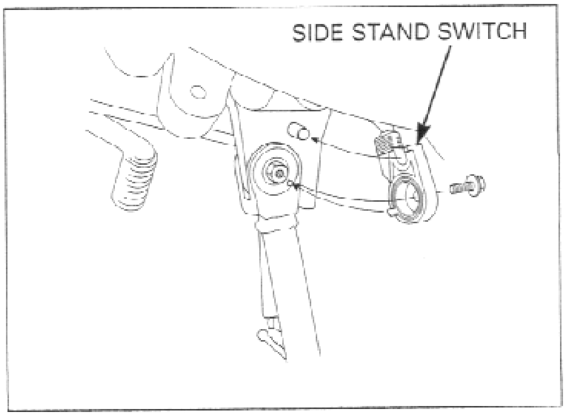
Disconnect the side stand switch 2P (Green) connector.

Remove the bolt and side stand switch.



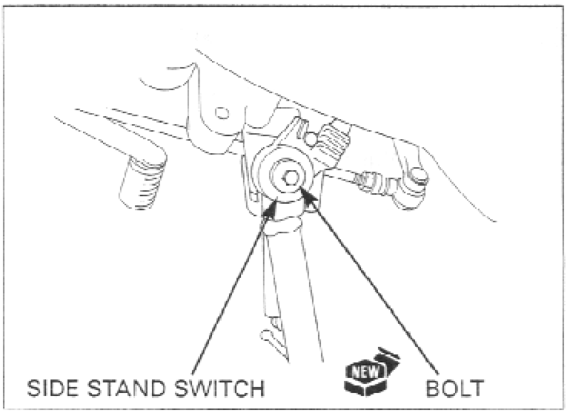
INSTALLATION

Install the side stand switch by aligning the switch pin with the side stand hole and the switch groove with the return spring holding pin.

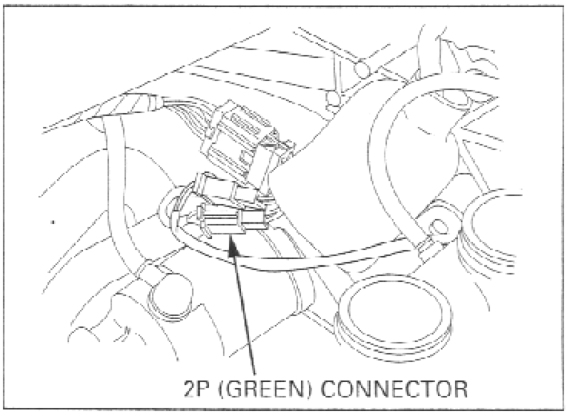


Secure the side stand switch with a new bolt.

TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)



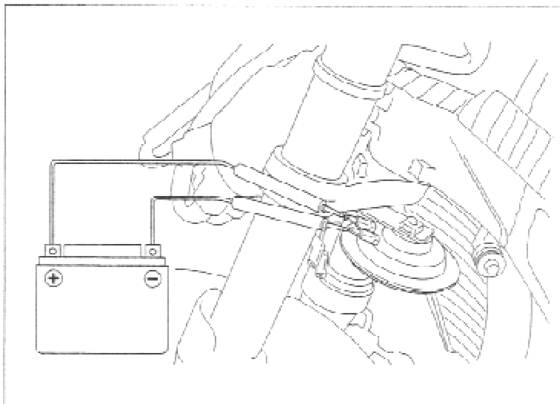
Connect the side stand switch 2P (Green) connector.



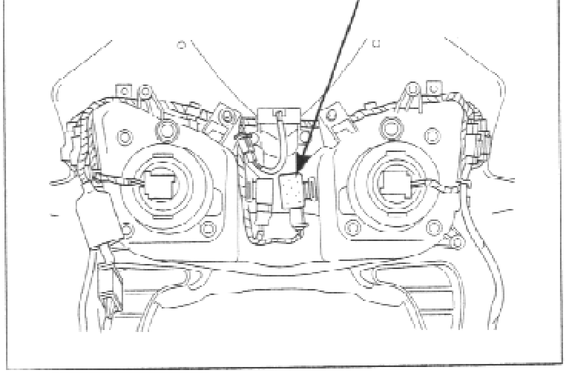
HORN

Disconnect the wire connectors from the horn.

Connect the 12-V battery to the horn terminal directly. The horn is normal if it sounds when the 12-V battery is connected across the horn terminals.



TURN SIGNAL RELAY



INSPECTION

Remove the upper cowl (page 2-9).

Check the following:
- Battery condition
- Burned out bulb or non-specified wattage
- Burned fuse
- Ignition switch and turn signal switch function
- Loose connectors

If the above items are all normal, check the following:
Disconnect the turn signal connectors from the relay.

Short the black and gray terminals of the turn signal relay connector with a jumper wire. Start the engine and check the turn signal light by turning the switch on.

↓ Light comes on
- Faulty turn signal relay.
- Poor connection of the connector.

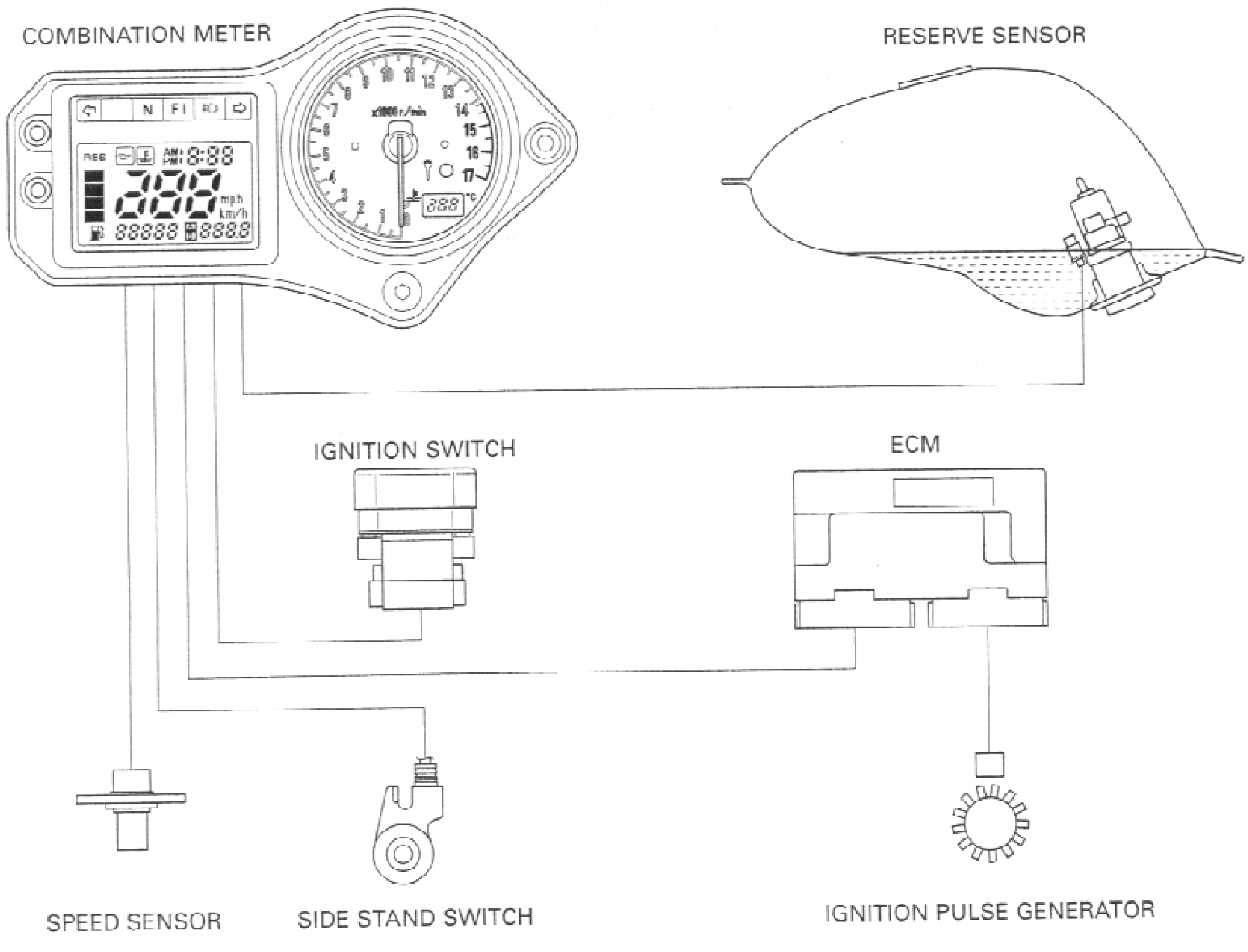
↓ Light does not come on
- Broken wire harness.

MEMO

FUEL RESERVE TRIP INDICATOR

This motorcycle is equipped with a fuel residual quantity indicator that indicate a residual fuel quantity according to the mileage incrementally.
The fuel reserve trip indicator is controlled by a fuel reserve sensor (thermister), ECM (engine revolution), vehicle speed sensor, side stand switch and ignition switch.

SYSTEM DIAGRAM



Function

First the fuel reserve sensor detects a low fuel condition, the combination meter reserve indicator and four segments of the fuel reserve trip indicators all light up (Fig. 1).

As the mileage increases, the segments begin blinking from the top down (Fig. 2 – 4), until all the segments are blinking (Fig. 5).

When refueling, the fuel reserve indicator is reset when the following conditions are met:

- More than 90 seconds have elapsed after the ignition switch is turned to "ON".
- The engine is running.
- The side stand is raised.

If the ignition switch is turned to "OFF" during the 90 seconds, the fuel reserve indicator will not reset until the next 90 seconds after the ignition switch is turned to "ON".

More than 90 seconds have elapsed after the ignition switch is turned to "ON" and the engine is running, but the side stand is lowed, the indicator will still blink until the side stand is raised.

The refueling amount is less than 3.5 liter (0.92 US gal, 0.77 Imp gal), the fuel reserve indicator does not reset.

If the fuel reserve trip indicator does not operate properly, check each part individually.
If there are no problems, replace the combination meter as an assembly.

Fig. 1:

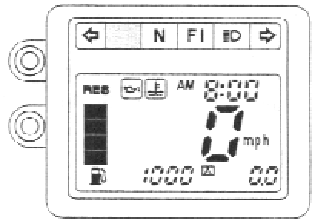


Fig. 2:

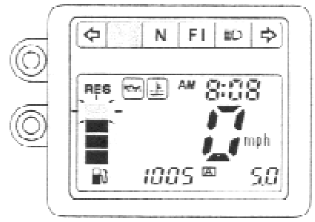


Fig. 3:

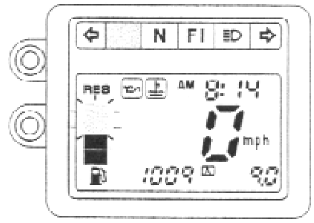


Fig. 4:

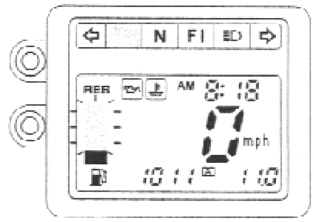
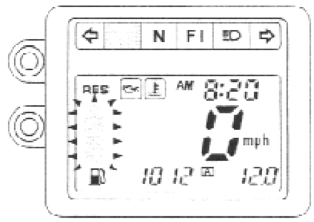


Fig. 5:



22. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START

		Possible cause
1. Check for operation of the fuel pump	Abnormal →	• Faulty fuel pump (Section 5)
↓ Normal		
2. Inspect the fuel flow	Abnormal →	• Faulty pressure regulator (Section 5)
↓ Normal		
3. Inspect the fuel injector	Abnormal →	• See section 5
↓ Normal		
4. Perform a spark test	Weak or no spark →	• Faulty spark plug • Fouled spark plug • Faulty ECM • Broken or shorted spark plug wire • Faulty ignition switch • Faulty ignition pulse generator • Faulty engine stop switch • Loose or disconnected ignition system wires
↓ Good spark		
5. Test cylinder compression	Low compression →	• Valve stuck open • Worn cylinder and piston ring • Damaged cylinder head gasket • Seized valve • Improper valve timing
↓ Compression normal		
6. Starting following normal procedure	Engine starts but stops →	• Improper starter valve operation • Intake pipe leaking • Improper ignition timing (faulty ignition coil or ignition pulse generator) • Fuel contaminated
↓ Engine does not start		
7. Remove and inspect spark plug	Wet plug →	• Starter valve closed • Throttle valve open • Clogged air cleaner

ENGINE LACKS POWER

Check	Abnormal result	Possible cause
1. Raise wheel off the ground and spin by hand	Wheel does not spin freely	• Brake dragging • Worn or damaged wheel bearing
Wheel spins freely ↓		
2. Check tire pressure	Pressure low	• Faulty tire valve • Punctured tire
Pressure normal ↓		
3. Accelerate rapidly from low to second	Engine speed doe not change accordingly when clutch is released	• Clutch slipping • Worn clutch discs/plates • Warped clutch discs/plates • Weak clutch spring • Additive in engine oil
Engine speed reduced when clutch is released ↓		
4. Accelerate lightly	Engine speed does not increase	• Air cleaner dirty • Restricted fuel flow • Clogged muffler • Pinched fuel tank breather
Engine speed increase ↓		
5. Check ignition timing	Incorrect	• Faulty ECM • Faulty ignition pulse generator
Correct ↓		
6. Test cylinder compression	Incorrect	• Valve stuck open • Worn cylinder and piston rings • Leaking head gasket • Improper valve timing
Normal ↓		
7. Inspect fuel flow	Abnormal	• Faulty pressure regulator (Section 5)
Normal ↓		
8. Inspect the fuel injector	Abnormal	• See section 5
Normal ↓		
9. Remove spark plugs	Fouled or discolored	• Faulty spark plug
Not fouled or discolored ↓		
10. Check oil level and condition	Incorrect	• Oil level too high • Oil level too low • Contaminated oil
Correct ↓		
11. Remove cylinder head cover and inspect lubrication	Valve train not lubricated properly	• Clogged oil passage • Clogged oil control orifice
Valve train lubricated properly ↓		

Possible cause

11. Check for engine overheating —— Overheating →
   - Coolant level low
   - Fan motor not working (faulty fan motor switch)
   - Thermostat stuck close
   - Excessive carbon build-up in combustion chamber
   - Use of poor quality fuel
   - Wrong type of fuel
   - Clutch slipping

   Not overheating ↓

12. Accelerate or run at high speed —— Engine knocks →
   - Worn piston and cylinder
   - Wrong type of fuel
   - Excessive carbon build-up in combustion chamber
   - Ignition timing to advanced (faulty ECM)
   - Lean fuel mixture

   ↓ Engine does not knock

POOR PERFORMANCE AT LOW AND IDLE SPEED

Possible cause

1. Check ignition timing —— Incorrect →
   - Improper ignition timing

   Correct ↓

2. Check the starter valve synchronization —— Incorrect →
   - See section 5

   Correct ↓

3. Inspect the fuel flow —— Abnormal →
   - Faulty pressure regulator (Section 5)

   Normal ↓

4. Inspect the fuel injector —— Abnormal →
   - See section 5

   Normal ↓

5. Check for leaks in the intake pipe —— Leaking →
   - Loose insulator clamp
   - Damaged insulator

   Not leak ↓

6. Perform spark test —— Weak or intermittent spark →
   - Faulty spark plug
   - Faulty carbon or wet fouled spark plug
   - Faulty ECM
   - Faulty ignition coil
   - Faulty engine stop switch
   - Faulty ignition pulse generator
   - Faulty ignition switch
   - Loose or disconnected ignition system wires

   ↓ Good spark

POOR PERFORMANCE AT HIGH SPEED

Check	Result	Possible cause
1. Check ignition timing	Incorrect	• Faulty ECM
Correct ↓		
2. Inspect the fuel flow	Abnormal	• Faulty pressure regulator (Section 5)
Normal ↓		
3. Inspect the fuel injector	Abnormal	• See section 5
Normal ↓		
4. Check valve timing	Incorrect	• Camshaft not installed properly
Correct ↓		
5. Check valve spring	Weak	• Faulty valve spring
Not weak		

POOR HANDLING

Symptom	Possible cause
1. Steering is heavy	• Steering stem adjusting nut too tight • Damaged steering head bearings
2. Wheel wobbles	• Excessive wheel bearing play • Bent rim • Improper installed wheel hub • Swingarm pivot bearing excessively worn • Bent frame
3. Motorcycle pulls to one side	• Faulty shock absorber • Front and rear wheel not aligned • Bent fork • Bent swingarm • Bent axle